ADDRESS TO STUDENTS. By Alex. Graham, F.S.A., Vice-President, at the Sixth General Meeting, Monday, 20th January 1896.

Ladies and Gentlemen, —

IT has been the custom in recent years for the President to deliver an Address to Students previous to the annual presentation of Medals and Prizes. The occasion is one of exceptional interest, and it must therefore be a matter of regret to all of us that the engagements of our revered President preclude his taking the chair this evening. In occupying this honoured position for a brief moment, by the privilege of the Council, I am quite aware that any words of mine, or any expressions of opinion, cannot have the same influence upon this assembly, and especially upon those to whom this brief address is delivered, as the weighty utterances of the distinguished gentleman who presides over our deliberations. But I rely on the goodwill of our younger brethren, assuring them that every word spoken from this chair is prompted by the highest motives—to direct them in their studies, to encourage and assist them in their career over the troubled waters of professional life, and to further day by day the object for which this Institute was founded—the promotion of architecture as the first of the Fine Arts.

Each year as it comes round bears its own record of progress or activity, and indicates in increasing measure the boundless requirements of modern life at the hands of the architect. Looking round the walls of the Institute, it cannot be said that inactivity has prevailed in our ranks during the past year, or that artistic power and manipulative skill show any signs of departure from that high standard they have attained in recent years. It is not my intention to offer any criticisms upon this magnificent display of drawings, for that pleasurable task will devolve upon others who take part in this evening's proceedings. But I venture to think that any impartial critic will find in many of these admirable works in line and colour far truer representations of the art of the architect than in the pretty little pictures that are made for the annual display at Burlington House. I am aware that differences of opinion prevail as to what is an architectural drawing, and as to the value of such pictorial representations by skilled draughtsmen as find favour at the Royal Academy. The pages of *The Builder* were open a few months ago to a free consideration of this subject, resulting in some valuable expressions of opinion which appeared from time to time in its columns. To my mind it has always seemed wrong for the architect to enter the lists, as a rival for public approval, on the same footing as the landscape painter, or in any branch of strictly pictorial art. The general public see in the galleries of the Academy devoted to painting and sculpture the creations themselves of the painter and sculptor, face to face. In the architectural room they do not see the architect's creations, but mostly pictorial attempts of varying degrees of merit, necessarily ineffectual, to represent them. So much of the pictorial art as finds place in an architect's drawing is an endeavour to represent, with more or less effect, the dimensions of a building, its symmetry, proportions, grace of line, and traits of invention. But an architect's drawing entirely fails to make felt the structure's weight and

mass, or to exhibit the skilled combination of the forces of down-pressure, thrust, and resistance which it embodies. The nobility of aspect never absent from an ancient masterpiece of architecture is a testimony to its having been conceived as an embodiment of these qualities, quite as much as a presentment of grace, symmetry, and proportion of line and surface. And in the realised combination of all its factors lies such a structure's supreme charm. In an architectural room no indication is possible that, in the conception of any design, one ounce of ponderable matter has been conscientiously dealt with. If, therefore, a work of architectural merit can only be rightly judged by the realised combination of all its factors, and if none but a skilled architect can form an approximate forecast of their realised expression, surely it is desirable to devise some means of impressing upon the general public, who saunter listlessly through an architectural room, their hopeless and absolute incapacity to pass judgment upon architectural designs. I make bold to say, with all respect to the august body that rules at Burlington House, that the ordering of the architectural portion of the exhibition admits of much improvement, and that more encouragement should be given to architectural drawings that are understood only by architects, and less to feats of pictorial draughtsmanship for the purpose of playing to the gallery.

In making these comments I have no desire to underrate the value of the beautiful drawings displayed on these walls, nor to check the aspirations of those whose manipulative powers with pencil and brush excite our admiration. But it cannot be too forcibly stated that draughtsmanship, however skilful, is not architecture. It is only a fascinating means to a nobler end, and its encouragement by those who control the teaching of a rising generation should not be at the expense of those more solid studies which are the essentials of any one desiring to take rank as an architect. The noblest edifices ever raised by human genius were conceived at a time when draughtsmanship, as we understand it, was unknown. In furtherance of my views on the subject of pictorial drawings, it is satisfactory to note that in many of the instructions in recent competitions for works of magnitude a clause is inserted to the effect that perspective drawings are inadmissible. It is a wholesome clause, not because it saves trouble and expense, but because, for the purposes of any assessor of experience, such drawings are unnecessary and often misleading.

The literary work of the past year may be regarded as satisfactory. Eight candidates entered the ranks for the Institute Medal, and three of the Essays submitted have received commendation from the adjudicators. All credit is due to the competitors for their patient research, especially to the author of the work which has deservedly gained the Medal. It is proposed to publish this Essay in our JOURNAL, and to add some remarks on essay-writing generally, as a guide to young aspirants in future years.

In the early part of last session some thoughtful Papers were read in this room by architects of repute on the subject of Simplicity in Architecture, showing by forcible reasoning that restraint was an element never to be neglected in architectural compositions. Without trespassing on your patience by referring to the arguments used to enforce their convictions, or even assuming that such sound teaching should necessarily be soon followed by practical results, it is enough for us to know that in the designs submitted for the prizes to be awarded this evening, simplicity is more apparent than in similar competitions of recent years. Overloading surfaces with meaningless ornament, which drew from Mr. Gladstone a remark by no means complimentary to modern architects, is kept in restraint; and simplicity—but simplicity without poverty, as Mr. Alma Tadema naïvely remarked—has established a position which, it is hoped, may be maintained by the rising school. I wish I could say that the results of judicious advice given here by Mr. Macvicar Anderson four years ago with respect to planning had been equally satisfactory. The subject selected for the Soane Medallion

Competition last year was easy of grasp, and yet there is evidence in most of the designs that convenience of arrangement had not received that share of attention which it deserved. But in justice to our younger brethren it should be observed that success in this important element of design is more frequently to be found in the works of older men, the outcome of a kind of knowledge which is not to be found in books, and the result of a wide experience of men and things.

One of the tendencies of modern times, both in Art and Literature—and in no art is it more conspicuous than our own—is to brush aside the teachings and methods of previous generations, and to regard the rules of our predecessors as so much unjustifiable restraint. But if we look back at those periods in history when architecture attained the highest degree of perfection, and attracted a large share of public notice, we shall find that methods and rules were held in veneration, and that the restraint they exercised not only strengthened the judgment, but had a salutary influence upon the taste of the period. It has been said that no new important principles of æsthetics remain to be discovered, and that anything approaching originality in architecture is restricted to new combinations of that which is old, aided by the employment of such new materials as the earth may disclose, and the discovery of new scientific inventions. Such combinations are practically infinite and inexhaustible; and science, which has done so much in our own time to facilitate the arts of construction, is always a loyal handmaid in the cause of progress. It is for the genius of the architect to utilise such resources to meet the varying requirements of his age, and to shape the whole into forms of beauty for the delight of mankind.

Introductory remarks addressed to an assembly of experts are generally tedious, and, like a long preface to a little book, are apt to become wearisome when the contents of the volume are inviting. The pages of the little book that I will now introduce to your notice comprise three short Papers of critical remarks upon the students' competitive work of the past year. These papers are the result of studious thought on the part of three selected members of our body. They have been written in the same good faith and with the same loyal spirit that prompted the penning of these few introductory notes; and I am sure that the students to whom they are specially addressed will give them an attentive and a patient hearing.

REVIEW OF THE DESIGNS AND DRAWINGS SUBMITTED FOR PRIZES AND STUDENTSHIPS 1896. On behalf of the Art Standing Committee.

THE SOANE MEDALLION AND THE GRISSELL MEDAL. By William Young [*F.*].

Mr. Chairman, Ladies, and Gentlemen,—

There are two ways of reviewing the designs and drawings: one is to say something nice of every one—this is the most agreeable way, but it would not be profitable to the students; the other way is to be frank, just as one would be if one were acting as assessor in a competition for a building to be erected. This may not be so pleasant, but it will be more profitable to the students, and it is probably what they themselves would prefer. Mr. Baggallay, Mr. Pite, and myself, appointed by the Art Committee to review the designs, have decided to adopt this course; and I would ask the students to take our criticisms in the friendly way in which they are offered, and as intended entirely for their benefit.

THE SOANE MEDALLION.

On looking round the drawings one is impressed with the large amount of careful work the students have bestowed in preparing these seventeen designs. The drawings throughout

are mostly excellent and creditable, but I must add that I have heard the opinion expressed, and I agree with it, "that the quality of the draughtsmanship is higher than that of the "designs." But this is natural, and what one would expect in students' works, for the art of designing comes only with practice and experience. In most cases the geometrical drawings are better than the perspectives, and many of the designs look better on the geometrical elevations than in the perspectives. There is only one Gothic design; the others are mostly of the modern classic revival school. This shows the present current or fashion of architectural design, for I think I should not be far wrong in supposing that if a competition similar to this had taken place fifteen or eighteen years ago, the position would have been reversed, and the majority of the designs would have been Gothic.

The design under motto "L'Espoir" has a well-considered, sensible plan, and fairly good elevations, especially in the composition. I do not think the corner tower adds to the quality of the design as much as it might have done. The upper part is heavy and not happy. The perspective shows considerable power of draughtsmanship. It is clever, but sketchy—a kind of impressionist drawing, which leaves a good deal to the imagination. This might find favour with a building committee; but when there is a professional assessor, I rather think there would be more chance of success by leaving nothing to his imagination. The design of the capital to the columns is quite original, but I do not think it would add to the author's chance of the prize.

"Mightier than the Sword" places the meeting room on the second floor, an arrangement that would not be likely to find favour with any of us. The elevation is bold and massive, but the main cornice is too heavy; and with the architrave under it, there being no frieze, the cornice looks about one-third the height of the column. On the ground floor there are massive rusticated columns, with a rustic course in place of a capital. This is really carrying the rustic, which seems to find so much favour at present, too far.

"Progress" gives us a better entrance-hall than many of the other designs, but the elevations suggest business premises rather than an Institute of Architects. The half-inch scale detail is weak.

"Compass" and "The Dun Cow" both show good designs, combining simplicity with good detail. The former has an attractive coloured perspective showing red brick and stone, and would make an excellent elevation for a mansion. There is a well-planned library, with indifferent lighting. The meeting-room is about 34 feet wide, with two rows of three-square pillars, leaving the centre space only 20 feet. This probably lost one chance of success.

"Royal" and "Green Dragon" are both extraordinary designs and do not show much knowledge of detail, although the latter shows a great amount of originality which would not be appreciated by an assessor. I notice that those students who by their drawings show most knowledge of detail and proportion have rather avoided attempting anything strikingly original; whilst those students who show least knowledge of detail and proportion have attempted most to be original. I may safely assure students that to be original, and at the same time good in design, one must know everything of the particular subject in hand.

"B in a Circle" is better in elevation than in perspective, where the pediments of the second-floor windows are too pronounced, and the keystones too conspicuous—nearly as deep as the width of the opening. This is probably a mistake in the drawing rather than in the design, which both in elevations and sections shows good qualities.

"Pseudonym" is an ambitious design, and the excellent drawings show that its author is well acquainted with classic detail and proportion; and yet somehow he seems to have missed the mark. I think this arises chiefly in the composition, for there is no want of skill and care in the drawings and detail, but there is a want of a leading feature. There are four

storeys, all of about equal importance. Surely the principal floor with the meeting-room might have been emphasised and made more important than those with smaller and less important rooms. The plan is compact; but here, as in most of the designs, the hall is cramped in size, and the meeting-room, 57′ 9″ × 24′ 5″, is too long for its width.

"Tarella" has a good deal of merit, and does suggest an Institute building, and the detail is sound and free from crotchets, but the top storey is rather weak. Here, again, the meeting-room is too long for its width, and the staircase and landings not large enough. The perspective does not do justice to the design.

"Red Thistle," the only Gothic design, has an excellent set of drawings, and has fairly well grasped the subject. He gives us an Institute building, and in the days when Gothic was popular this design would probably have been given a high position. The plan is not of equal merit with the elevation, and three committee rooms about 11 feet wide on the second floor would not help his chance of success.

"Ad Finem" is another good set of drawings, and the perspective does better justice to the design than most of the others. The drawings show an accurate knowledge of detail, and the design altogether, without any trying for originality, looks sensible and practical, and just the kind of design that a client would be likely to build. Rustication, which is overdone in some of the other designs, is also used here, but it is kept within moderate bounds. If anything, the columns are a little too thin, and the pediments of the first-floor windows, as shown on the perspective, a little too prominent. The plan is fairly well worked out, but more importance might have been given to the entrance-hall and the staircase, the latter being top-lighted. The exhibition-room on the ground floor, with windows only in the ends, would not be too well lighted. The landings and passages on the first floor are too narrow —about 6 feet wide. Competitors, as a rule, have not seemed to realise the importance of a good entrance-hall and staircase, and wide landings and passages on the principal floor.

"Thor." To show the different views taken by competitors, I would mention that in this design the landings and passage on the principal floor are 11 feet wide. This is more like what it should be. There is also a good entrance-hall, the best of any. This is one of the few designs where the author seems to have seen the advantage of a good-sized hall and staircase and landings. The drawings are well done, and the design in composition and detail is good, whilst the delicate but effective perspective shows much skill in draughtsmanship.

"Fleur de Lys." At first sight this design appears too extraordinary—a kind of Alhambra—but on closer examination one finds it full of ability, both in draughtsmanship and design. True, it is not the popular architecture of the day; it rather recalls to one's memory the stones of Venice, with a dash of Oriental, a design that would warm the heart of Mr. Ruskin. There is a large amount of delicate detail, well drawn, and yet plenty of broad plain surfaces. The composition is excellent, and the corner tower would make a most effective feature. On plan the entrance-hall with its octagonal ends would be a good feature, but the landings and passages are, as usual, too narrow. I congratulate "Fleur de Lys" on a design that shows great ability, even if it is extravagant, according to our present-day ideas.

"Bow Bells" is a bold design, but rather heavy. The ground floor and first floor are simply treated in stone, and the centre portion, with its columns of the same materials, is quiet and effective; but the two large red-brick panels at the sides, with another at a higher level in the centre, would be too much even for an Institute of Architects. In execution the library would be much in need of a window in one of these blank wall spaces. The crush-room on the first floor is an excellent feature. I think this is the only design that introduces it.

I have remarked that some of the designs look better in elevation than they do in perspective. I think the reason for this is, that the true value of projection in its effect upon a

design is not thoroughly appreciated, and in perspective projection is shown, whilst in geometrical elevation it is not. A design in thoroughly good proportion in its surface sizes, as shown on an elevation, may be entirely altered and spoilt if the projections are wrong. On looking over the designs one is reminded that the rustic is still fashionable, and very often it is overdone. We have rustication in walls, in columns, in arches, in architraves, in lintels; we only want to go two steps further, and have rusticated cornices, and perhaps a rusticated figure in sculpture. After that the rustic will assume its proper place. I am quite sure of this, that if our students and others could study the early Renaissance buildings in Italy for a short time, when they came back we should find more proportion and refinement in their work, and less rustication.

THE GRISSELL GOLD MEDAL.

"Ebor" suggests a Band Stand of wood construction, the floor raised on a flight of steps continued all round, which would have a pleasing effect. The various parts are generally well designed, but the turned columns look more suitable for newel posts.

"Pan" is an effective design, simple in general lines, with little ornamentation, but a good deal of sculpture judiciously introduced. The simple treatment of the columns is good.

"Fore ! !" is somewhat similar in outline to the last design, but here the columns are elaborately moulded and carved, and look more suitable for interior work; quite a contrast to the balustrade, which is quiet and good.

"Orpheus" carries simplicity too far, especially in the weather-boarded base extending from the ground to the platform level.

"Zampa" is a complete contrast to the last design, and is the most elaborate of all the designs submitted. The ornament in itself is good and carefully drawn, but it is almost over-ornamental. The design in outline and proportion is good, and the details of construction carefully shown are evidence of the work of an experienced designer, who has spared no pains in his work. "Cornet" and "Japan" are only conspicuous by their simplicity of design.

Very wide and different views must have been taken by competitors, for whilst some of the designs might be executed for 100*l.* or at most 200*l.*, others would cost ten times that amount. I conclude by congratulating the winners. I hope their success here may lead to further successes. To those who have not been fortunate enough to be placed first, I would say, The competitions of the future are as open to you as to the others, and the work you have done and the experience you have gained in these competitions make you all the stronger in design, and thus more likely to succeed in future competitions.

THE PUGIN AND OWEN JONES STUDENTSHIPS. By Frank T. Baggallay [*F.*].

The section which has fallen to me to review is the work in the Pugin and Owen Jones Studentship Competitions. This affords me an opportunity to express, by way of preface, the great regret I have for some time felt, and which I know is shared by other observers, in noting the growing tendency among students to neglect the wholesome discipline of sketching old buildings and making drawings of them from their own notes and measurements. I know the difficulty of choosing among the many studies the pursuit of which is supposed to be essential to the would-be architect; but there should be no difficulty whatever in putting the study of buildings themselves, especially of those whose beauties are acknowledged and have stood the test of time, in the foremost place; and there is no means of following such a study which can compare for a moment with drawing the objects themselves, and ascertaining, and recording on the spot, from measurement and observation, the dimensions and proportions of the parts and the effects which they produce. If any one doubt this, let him try the experiment of learning all he can about a building in some other way, and then let him only sit

down opposite it to make a sketch, and I am sure that in five minutes he will be convinced. A few years ago there was no need to insist on the importance of this study, and there are plenty of students who acknowledge it still; but that others despise, or at least ignore, the practice of sketching I am sure; and to all such I say, beware of adopting the attitude of the young writer who, on being asked if he had read a certain standard work, replied that he did not *read* books, he *wrote* them. It is not a question of making up pattern-books for future use; it is not even a question of acquiring a thorough knowledge of the architecture of the past, though that alone were no unworthy object; it is chiefly a question of *training*, of quickening the perceptions and refining the tastes, of teaching the eye to see and the mind to observe and compare, and of making the eye and the hand familiar with beautiful forms and proportions. Without such training it seems to me impossible that our work should have upon it that stamp of the cultured artist which we all desire to see.

That, as I said, there are still students left who practise the art of sketching, the drawings submitted for the Pugin Studentship are evidence. There are this year six sets. Two of them —those by Mr. Brewer and Mr. Swan—appear to me to be worthy of the traditions of the competition, while in a third set—Mr. Rickards's—are, among a good deal of rough and inferior work, several drawings of very exceptional merit, falling little, if at all, short of the best work submitted for the prize in past years.

Beginning with the first set on the left, by Mr. Cecil C. Brewer: his sketches, if not quite so strong as some work in this competition on former occasions, are nevertheless admirable. They are neat and workmanlike, the drawing is good, and the touch firm and confident. Essentials are all shown with care, and are not embarrassed or obscured by unnecessary lines and shadows, while the slight washes of colour are in many cases very useful. The two best water-colours, the sketches at Ipswich and Coutancy, are, I think, stronger in their way than the pencil-work; the colour is fresh and bright without being harsh, and the execution is easy. In each case I think the front of the picture would hold its place better if a little stronger in tone. The measured drawings are the least effective, but, though weak in appearance, are really most conscientiously and beautifully executed.

The next set of three strainers are witnesses to earnest endeavour, and one or two of the smaller sketches are promising; but the author should try to resist the temptation to use so much pencil in attempting strong and picturesque effects: his object is, or should be, the study of architecture, and not the production of pictures. It is, I imagine, to warn competitors against this error that in the instructions a note is inserted to the effect that "The "Council attach special value to *untouched* perspective sketches *done on the spot*"—that is, as I read it, to work done, as far as can be judged, for the purpose of study, and not got up as pictures for exhibition.

In the case of the next set, the author has gone to the other extreme, and has been content with rather meagre line-work.

Mr. Rickards's work, which comes next, is that of a very strong and facile draughtsman. Several of the pencil sketches—unfortunately they are not the ones most in evidence—are exceptionally clever: I refer to the Florence fountain, the Pisa lectern, and the St. Mark's capitals. His very facility, however, seems to have betrayed him in other cases into an apparently impatient rapidity which it is difficult not to call carelessness. Mr. W. M. Carter's best and most useful drawing is the bay window at Welburn Hall. The other measured drawings represent good work, but the sketches are not above the average, and he seems to have cramped his style by the use of too small a sketching-block.

The very good studies submitted by Mr. James A. Swan seem all to have been made in Belgium in the course of three months last summer. The drawing is firm, generally

correct, and free from tricks and laboured effects; the execution appears rapid but is somewhat mechanical in effect, especially in the seven large views hung along the top of the screen. I, for my part, rather doubt the usefulness of studies of the sort at all, and certainly prefer the smaller and more businesslike sketches below. The most important and effective drawing, however, is the geometrical one of the front of "The Skipper House" at Ghent. I am not quite sure that the remark about the absence of tricks quite applies to this drawing, but it is certainly beautifully executed, and the effect achieved is good.

The Owen Jones Studentship has, as usual, attracted but few competitors. It is a pity that the one prize offered among architects for the study of colour should be so little sought after. Of the three sets of drawings exhibited, two—Mr. East's and Mr. Corlette's—are excellent. I prefer Mr. East's, but the subjects chosen for illustration are so different that comparison is not easy. Mr. East's colour is clean and bright and harmonious; his drawing of the figure is rather weak, but otherwise the execution leaves nothing to be desired. He has made no studies of English or Gothic work, which, perhaps, accounts for the absence of any harsh colouring. Mr. Corlette, on the other hand, has confined his attention solely to Gothic examples, and, interesting as they are, the colour is not in all cases pleasing. His handling of colour seems to me somewhat unequal, the drawings of Sant' Anastasia, Verona, and of the ceiling of the Lady Chapel at Chichester are very good, but there are others by no means equally so. The execution, apart from the colour, is unexceptionable throughout.

In conclusion, I cannot but express the hope that this prize will be better competed for in future; it does not seem to be generally appreciated what a powerful weapon, for good or evil, colour may become in the hands of the architect. Beside which, every year the use of coloured materials becomes more general, and it will not be long possible for the man who knows nothing of colour to avoid it as he has been in the habit of doing. Students should take warning in time and master it so far as they may.

THE MEASURED DRAWINGS MEDAL AND THE TITE PRIZE. By Beresford Pite [*A.*].

"Gvlielmvs" has been successful in his access to and choice of a fine subject for the Measured Drawings Medal. The classic fronts of Hampton Court are sure to look well and impressive with moderate draughtsmanship, and during the present architectural mode there is much useful material acquired by learning its details for daily practice. The sketches and plottings submitted, upon which the drawings are built, are voluminous, and apparently have been collected during the past three years; they are as unsystematic and disconnected, and, I may add, as uninteresting, as such sketches usually are. There is a noticeable lack of full-size mouldings, some of half and quarter full-size being substituted. The finished drawings, consisting of the two main elevations and a plan and part section, and two half-inch scale details, are fairly drawn in their geometrical portions, but the freehand drawing of the carving and ornaments lacks refinement and feeling, while the pedimental sculpture disfigures its surroundings. The lining-in of the materials in the small scale elevation is carried out too hastily, and does not, as it may so easily, improve the effect by giving solidity and texture to the drawings, but the half-inch details are more free from this defect. The full-size details are insufficient and confused, and do not embody all the necessary matter, which is, however, to be found in their corresponding sketches.

"X."—The subject chosen is a fine old Lincolnshire church at Gedney, full of the variety of interest in traceries, arcades, and styles, with interesting carpentry and masonry construction, that characterises most old English country churches. The sketches are very scrappy and the plottings few, the measurements in many particulars being insufficient for reliable detail drawing. The drawings of such a subject should, in the hands of a thorough

student, become reliable data for the archæologist, but in this case it is difficult to trust the finished drawings upon some points of interest and note. The tower has a very beautiful Early English belfry storey below the later Perpendicular addition; upon the sketch of this charming early carved capitals are shown to the single columns subdividing the arches, which are omitted in the drawing, the columns being shown with bells. The early angle shafts to the tower buttresses upon the same sketch are shown with moulded bases and caps, and upon the drawings bases only without caps are shown. Upon the same buttresses interesting quatrefoil sunk panels are shown, with a quaint variety of which no trace can be found in the sketches. The geometrical drawings are clean and excellent in their neatness, and the details especially so, but they are mere fragments, without connection. The jointing shown on the drawings does not exist in the sketches. There is no long section showing the nave arcade.

"Sforzo."—The Library of Trinity College, Cambridge, which is illustrated in this set of drawings, not only has the interest of being externally a classic design of great majesty and power, by Sir Christopher Wren, but of possessing an interior of equal beauty and dignity. It is an ideal library interior to the architect, well lit, lofty and spacious, the bookcases arranged with artistic effect and pleasant in their low wood-colour, with quaint busts standing upon them, imparting a very piquant effect suitable for such a storehouse of treasured wisdom. The sketches submitted are rough, but the full-size mouldings are businesslike. The geometrical drawing is clear, but without interest or power, and the freehand work fails. The detail suffers from being drawn on inferior paper. The full-size drawings of mouldings are bold but confused.

Coat of Arms (device). Charter-House.—This set consists almost entirely of a survey plan of the irregular courts and buildings of this charming corner of Old London. The hall or chapel, which would repay careful study and measurement to a large scale, is here only shown very imperfectly. The elevations showing random roofs and walls, and the sections, have much work but little usefulness in them, the points of interest being undeveloped.

Students should bear in mind that the relationship their measured studies have to the actual buildings is exactly similar, though reached by an inverse procedure, to the plans, working drawings, and details which are needful for the erection of a similar work of architecture. System and clearness should be as present in the sketches and drawings as in the finished show-drawing. I would venture to recommend that the full-size details be taken first, and sketched and plotted in such a manner as not to require re-drawing. With these in hand, a column or two of horizontal and vertical dimensions will enable the half-inch scale detail drawing to be set up, having the worked-out thoroughness that will enable a mason or craftsman to build a replica without the original model. With this matter produced, and everything being drawn to a large scale for which a workman would require a detail, either constructionally or decoratively, the small scale plans and elevations giving the relations of the several parts can be satisfactorily completed. Measured drawings must be thorough. Sketches are only sketches, and satisfactory architecture or measured drawings cannot be produced from sketchy sketches. Let every measurement taken have an object, and accomplish it with accuracy. Examine Mr. Penrose's reproductions of his plottings and measurements in *The Principles of Athenian Architecture*, if you have any wish for a lofty and scientific ideal of measured drawings.

The subject of the Tite Prize Competition, being the design of a stone bridge over a wide river, possesses an appositeness that should impart an element of public interest to the consideration of the drawings; and with some reservations that may become apparent, we may congratulate the Institute upon the exhibition of designs. Several of the designs submitted,

if executed, would certainly be no disgrace to any city blessed with such a river as we have in London, or as Dublin has in the Liffey.

The requirement that the bridge should have the character of a national memorial perhaps needed some fuller definition, in order to secure satisfactory consideration on the part of the designers, it being a matter of obvious difficulty to reflect enthusiasm for anonymous heroes or potentates in monumental architecture. Our national phlegmatic indifference to mere greatness and our want of instinct for the monumental quality in fine architecture are evident enough in the designs exhibited, no one competitor having satisfactorily combined an expression of national wealth and glory with good monumental architecture, or either element with a satisfactory bridge. We must pronounce the competition a failure, and a predestined failure, too, in the production of a design fit for any purpose of national memorial, and proceed to examine what remains of the designs from the utopian standpoint of a County Council in search of a good bridge design. The designs are now passed under review without any intention of using their order as one of merit.

"Australis."—This design can be briefly described as London Bridge-like. The river is spanned by seven elliptical arches, and the adjoining embankments with smaller ones. The construction is apparently good: it is fully and attractively shown on the detail sectional drawing. The planning of steps to the embankment is satisfactory. Architecturally the style of treatment adopted does differ from its prototype, but is manifestly inferior in refinement, in grace, and in sense of line. The line of the bridge itself, that is, the æsthetic value of the two gradients as shown in the main cornices and parapets, has not in this case the slightest architectural value. Any beauty that the two slowly ascending gradients might possess is lost, and apparently there is a ridge at the centre of the bridge to divide the counties, the break of line being emphasised in elevation by a lamp pedestal. The horizontal tops of the great piers, which break the gradients of the cornice unavoidably, are also emphasised by a further break in the design of the parapet; and by the elevation of the central piers into lofty pedestals for recumbent lions, all possibility of a continuous and satisfactory line across the river is destroyed. The pedestals for sculpture at the entrances are well placed and suitable, and the lamp-posts are shown in the correct position. The architectural detail is commendably simple, but the cornice and parapet are both short and thick in their proportions, the latter, which is a balustrade, being very dumpy. The open-arched return piers to the embankments are a mistake, solidity and mass being required in that position. The draughtsmanship is clear and strong, but fails in artistic feeling, and a bird's-eye position for a perspective of a bridge is a mistake. The second-hand sculpture that is shown mars the drawings, the architect's proper direction of such work being misapplied in making the groups and recumbent lions turn their backs on the world and city, and face each other in antagonistic pairs.

"Perseverando."—In this design the added requirement of the conditions for a national memorial is dealt with by adding to a simple bridge design certain features of a monumental character, for the sake of added dignity and picturesqueness. Four entrance archways to the embankments below flank the approaches to the bridge, and upon each pier are placed small domed pavilions. This treatment is logical, and fails only because of the detached character of the various features which do not collectively add value to the design. Constructionally, this design is unobjectionable; the planning of the roadway is unimpeded, but the subway connecting the embankment, with the refuge in the roadway over for lighting, is too small and dark. The effect of the stairs at the junction of the bridge with the shore is somewhat confused. The drawings do not show sufficient constructional details, and evade the solution of the main problems connected with carrying the roadway upon the piers.

Architecturally, the design of the bridge itself is excellent, and possesses a distinct grace and beauty of its own. The lines of the gradients have been softened at their junction between the centre piers, and are blended in a subtle curve, I hope intentionally, with a very successful result. Shorn of its pavilions, which do not, however, seriously interfere with the general effect, the breadth of effect, the beauty of the line with which the banks are united, and the justness and simplicity of the proportions of its seven segmental arches entitle this design to the highest praise. It has also a recognisable Italian feeling in harmony with the traditions of the competition. The architectural detail is fair, the draughtsmanship clean and sufficient, the perspective from the river-level artistic and delicate. It is seldom that students' designs have such a distinguished breadth and simple sense of beauty as this set of drawings displays.

"From Bank to Bank."—This is a good plain bridge design, all attempt at any other expression of national recollection than that of sheer utilitarianism being abandoned, and all architectural details and forms are reduced to a minimum. The general line is good; the seven arches are frankly segmental with simple channelled voussoirs. The piers are obliquely placed to the stream and bridge, a satisfactory adaptation of the mediæval plan, and are sloped backwards buttresslike, perhaps with a somewhat exaggerated force. The cornice is a simple table carried upon moulded brackets, without other supporting members, and is original and satisfactory in effect. The design is marred by the awkward corbelling of semi-octagonal recesses from the footway upon the head of the piers. The plan of the piers, however, would probably render any proper termination a matter of some difficulty. Steps to the embankment descend frankly and boldly at right angles from the footway. The draughtsmanship is clear and good. The perspective is taken from the embankment, and has no beauty of effect.

"Calypso" is a bold scheme for crossing the river with five arches, the centre one having a span of about 130 feet. The arches are bad in shape, being that mongrel type of semi-ellipse which is produced by the use of three segments. The piers have small projection, and are semicircular on plan. Triumphal arches are placed across the roadway at each end, having an elliptical arch over the road and semicircular ones towards the embankment. The general line is good, the junction of the gradients being effected by a line of three planes, but the architectural elements and details are poor. The arch-mouldings, the rustications, and cornice are thin, and the parapet the reverse. Undesirable winding steps are placed to the embankment. Chariots and horses upon the piers with their backs to the bridge and their action towards the river seem unsuitable. The draughtsmanship is poor, especially in the freehand work.

Halfpenny Stamp (device).—This design is boldly original in its architectural character, but original without the power of goodness. Distinctive monumental character is imparted to it by four pavilions at the entrances, each of two storeys crowned by a group of domes. Staircases within give access to belvideres; wide flanking steps are provided to the embankment. The river is spanned by seven elliptical arches, having no other treatment of their voussoirs than small alternating rustics, but each arch has a carved keystone. The piers are cut away to provide ornamental features and sculpture, and the centre piers are squinched outwards and widened above. The cut-waters to the piers are prow-shaped and of good form, imparting great character to this part of the bridge. The perspective is pleasantly tinted in sepia, but makes the mistake, also noticeable in other drawings, of failing to show light through the arches of the bridge. The design has an Indian flavour, and maintains, with reservations as to its architecture, a certain monumental character.

"Pons Asinorum."—This design departs from simplicity in the treatment of the arches by providing an inner drop arch in each bay of a fuller segmental curve, producing an effect that would be picturesque in a tower watergate, but which destroys the breadth and depth of

effect so valuable in a bridge. Large semicircular recesses are formed in each pier for sculpture, with an arch semicircular both on plan and elevation above, forming a mere canopy, and thus giving an impression of weakness. Bronze groups are placed in the piers above the water-level. Nautical columns appropriately carry lamps above the piers. Great triumphal entrances are placed at each end, greatly narrowing the roadway and forming bold obstructions. Extensive embankment approaches and water stairs are shown, and the whole treatment of the shore end has been well considered. The lines of the gradients simply meet each other in the centre. The cornice has the unusual feature of a frieze and small fascia below. The drawings are clear and good, but the architecture of the triumphal archways is unworthy.

"Red Star" (device) employs nine elliptical arches, and inserts a shallower drop arch under the roadway to carry the mains; the lamp-posts are therefore placed in the centre of the roadway, as in St. Pancras, and are spaced out without reference to the piers and arches, which is a mistake. The general line of the gradients in the parapet is boldly tilted up at the point of junction over the centre arch, and the cornice is broken by a semicircular head to a canopy over the keystone, all of which is unsatisfactory in treatment. The piers are original, being plain semi-octagons on plan, the cornice of the bridge being stopped into their splayed sides. The centre piers are carried up for sculpture. The entrance is ramped on plan with circular sweeps, giving increased width for access, which is desirable. The cut-waters are suitably prow-shaped, but the standing figures and canopies upon them around the piers are evidently out of place.

"Ponte."—The river is crossed by nine arches, a pair of arches, semicircular shape, being provided at either shore. Whatever advantage this may afford, by increasing the height under the bridge at the banks, is counterweighed by the æsthetic loss of continuity and strength to the whole bridge. The design generally is very elaborate and over-ornamented, the parapet being broken up over every arch, as well as by a number of dwarf obelisks; the piers are crowned with domed pavilions, and afford further opportunities for the use of detail. The entrances are well planned, with convex colonnades terminated by pavilions and monumental pedestals, the steps to the embankment being designed behind the columns. This portion of the design is well thought out, and good, if not grand, in conception. But the whole is overdone with detail, while the constructional details are meagre.

"Avenel" provides four monumental tourelles at the entrances, recessed from the line of the pathway. The general line has been well considered, and the effect is good. Nine segmental arches are employed, and are rather small in effect. Each pier is partly square, partly oblique, and partly circular on plan, and the effect is therefore broken and weak. The tourelles might be monumental and good if their architectural proportions were improved; the other details are simple and fair. The draughtsmanship is good, and the perspective sketch of a portion strong in effect.

"The Owl" uses seven segmental arches, with shallow semicircular piers. The architecture is elaborate, but applied. Columns are clustered around the piers, and the spandrils of the arches are sunk and ornamented. There are no features to break the lines, and the general ornamental character has been relied upon for effect. This is, however, lacking in beauty and feeling. The section is elaborately figured.

It will be found, upon a general review of the students' designs, that those authors have been most successful who have recognised that in the purpose of a bridge lies a poetic beauty itself sufficiently expressive to need only the simplest means for architectural realisation. A great arch doing a great work is a poem in itself, and a number of great arches, each varying in a progressive series, and springing from piers well founded in an ever-moving river, supply a motive for restrained and sympathetic enthusiasm in design seldom to be found in pro-

fessional practice. Happy, and to be envied, are the students who have been enabled to devote long and eager hours to the construction of this delightful castle in the air. *Labor ipse voluptas!* Architecture bestows her own rewards lavishly, and without those irritating limits and considerations which suggest and compel all human selections.

9, Conduit Street, London, W., 23 *January* 1896.

CHRONICLE.

PRIZES AND STUDENTSHIPS 1896.

The Fifth General Meeting: The Deed of Award.

Gentlemen,—Pursuant to the terms of the By-law 66, that the Council shall, by a Deed or Writing under the Common Seal, award the Prizes and Studentships of the year, and announce such awards at the next General Meeting after the adjudication, the Council have the honour to state that they have examined the several works submitted for the two Silver Medals of the Royal Institute, the Soane Medallion, the Pugin and the Owen Jones Studentships, the Godwin Bursary, the Tite Prize, the Grissell Medal, and the Aldwinckle Studentship.

The Royal Institute Silver Medals.

(i.) *The Essay Medal and* £26. 5*s.*

Eight Essays were received for the Silver Medal, under the following mottoes:—

1. John Bull.
2. Floruit.
3. A Priori.
4. Conditioned.
5. Lotus.
6. Caber Feidh.
7. Research.
8. Non Nobis Solum.

The Council have awarded the Silver Medal and Twenty-five Guineas to the author* of the Essay bearing the motto "A Priori"; a Prize of Books of the value of Five Guineas to the author† of the Essay marked "Conditioned"; and a Certificate of Honourable Mention to the author‡ of the Essay marked "John Bull."

(ii.) *The Measured Drawings Medal and* £10. 10*s.*

Four sets of drawings were sent in, of the several buildings enumerated and under motto, as follows:

1. "Sforzo":—The Library of Trinity College, Cambridge.
2. "Gvlielmvs":—Hampton Court Palace.
3. "X":—Gedney Parish Church, Lincolnshire.
4. Coat-of-arms (device):—The Charter-House of London.

The Council have awarded the Silver Medal and Ten Guineas to the delineator* of Hampton Court Palace, a set of drawings submitted under the motto of "Gvlielmvs"; and a Medal of Merit with Five Guineas to the delineator† of Gedney Church, a set of drawings submitted under the motto of "X."

The Travelling Studentships.

(i.) *The Soane Medallion and* £100.

Seventeen designs for an Institute of Architects were submitted under the following mottoes:—

1. Fleur de Lys (device).
2. Tarella.
3. "Fleur de Lys."
4. Bow Bells.
5. The Dun Cow.
6. Ad Finem.
7. L'Espoir.
8. Pseudonym.
9. B (in circle).
10. Thor.
11. Compass.
12. Cadmus.
13. Green Dragon.
14. Mightier than the Sword.
15. Progress.
16. Royal.
17. Red Thistle.

The Council have awarded the Medallion to the author‡ of the Design bearing the motto of "Ad "Finem," with the sum of One Hundred Pounds for architectural study abroad, during a period of not less than six months, under the specified conditions. They have also awarded a Medal of Merit to the author§ of the Design bearing the motto of "Thor"; and a Certificate of Honourable Mention to the author‖ of the Design bearing the motto of "Bow Bells."

(ii.) *The Pugin Medal and* £40.

Six applications were received for the Pugin Studentship from the following gentlemen:—

1. Ernest Charles Henry Bird (York).
2. Cecil Claude Brewer.
3. William Morris Carter (York).
4. Edwin Morcombe Hick (Bath).
5. Edwin Alfred Rickards.
6. James Alfred Swan (Birmingham).

The Council have awarded the Medal and (subject to the condition, among others, that the said candidate devote a tour of not less than eight weeks' duration in some part of the United Kingdom to the study of Mediæval Architecture) a sum of Forty Pounds to Mr. Cecil Claude Brewer.

(iii.) *The Owen Jones Certificate and* £50.

Three applications were received for the Owen Jones Studentship from the following gentlemen:

* Banister F. Fletcher [*A.*]. † John J. Cresswell [*A.*]. ‡ Edward Albert Jollye.

* Hugh P. G. Maule [*Probationer*]. † C. Wontner Smith [*Probationer*]. ‡ R. Shekleton Balfour [*A.*] § John Anderson [*A.*]. ‖ Edwin Alfred Rickards.

1. Hubert Christian Corlette [*A.*].
2. Hubert Springford East [*A.*].
3. John Frederick Fogerty [*A.*], Bac.Eng. (Bournemouth).

The Council have awarded the Certificate and (subject to the condition, among others, that the said candidate devote a tour of not less than eight weeks' duration to the improvement and cultivation of his knowledge of colour as a means of architectural expression) a sum of Fifty Pounds to Mr. Hubert Christian Corlette [*A.*].

(iv.) *The Godwin Medal and £40.*

Four applications were received for the Godwin Bursary, from the following gentlemen * :—

1. Robert Stephen Ayling [*A.*].
2. Alexander Nisbet Paterson [*A.*], M.A. (Glasgow).
3. George Alexander Thomas Middleton [*A.*].
4. Ernest William Malpas Wonnacott [*A.*], F.A.S.I.

The Council have awarded the Medal and (subject to the condition, among others, that the said candidate spend not less than five weeks in some part of America or Europe, other than Great Britain and Ireland, for the purpose of studying and reporting on works of modern architecture) the sum of Forty Pounds to Mr. Alexander N. Paterson [*A.*], M.A.

(v.) *The Tite Certificate and £30.*

Ten designs for a Stone Bridge were submitted under the following mottoes :—

1. ½*d.* Stamp (device).
2. Perseverando.
3. Ponte.
4. From Bank to Bank.
5. Australis.
6. Avenel.
7. Calypso.
8. Pons Asinorum (device).
9. The Owl.
10. Red Star (device).

The Council have awarded the Certificate and (subject to the condition, among others, that the said competitor, after an absence of not less than four weeks, shall submit satisfactory evidence of his studies in Italy) a sum of Thirty Pounds to the author † of the Design bearing the motto "Australis."

Prize for Design and Construction.

The Grissell Medal and £10. 10s.

Nine designs for a Polygonal or Circular Band Stand were submitted under the following mottoes:

1. Accoustic (*sic*).
2. Zampa.
3. Fleur de Lys (device).
4. Ebor.
5. Orpheus.
6. Pan.
7. Japan.
8. Cornet.
9. Fore ! !

The Council have awarded the Medal and Ten Guineas to the author ‡ of the Design bearing the motto "Zampa."

The Aldwinckle Studentship (Value £50).

The Council, having decided to award the Studentship for the year 1896 to the person who, among all those submitting works for the Prizes and Studentships 1895–96, will, in their opinion, best carry out the donor's intentions—this Studentship being due to the munificence of Mr. T. W. Aldwinckle [*F.*]—have selected Mr. H. S. East [*A.*], provided necessarily that he fulfil the required conditions as to travel and study in Spain for a period of not less than eight weeks.

The Ashpitel (Examination) Prize.

The number of persons who qualified for candidature as Associate at the March and November Examinations of the year 1895 was sixty-one; and under the terms and conditions of the Ashpitel Prize it is to be awarded to "such candidate in "the Obligatory Architectural Examination" as shall have most highly distinguished himself in such Examinations held in the course of a year, and who is reported by the Board of Examiners as deserving such prize. But the Board have reported that during the past year none of the sixty-one successful candidates has distinguished himself sufficiently to deserve the Ashpitel Prize, which is a Prize of Books value Ten Guineas; and they have recommended the division of that amount between two candidates whose names they have reported. The Council have consequently awarded a Prize of Books value Five Guineas to Mr. Geo. J. Thrift Reavell [*A.*] and Mr. W. Chas. Waymouth [*A.*] respectively.

Travelling Students' Works in 1894 and 1895.

The Tite Prizeman 1894.—The Council have approved the work of Mr. Alexander Robert Hennell [*A.*], who was awarded the Tite Prize in 1894. Mr. Hennell left in March 1895 and returned in May, having visited Genoa, Siena, Viterbo, Rome, Florence, Venice, Verona, Milan, and Pavia.

The Soane Medallist 1894.—Mr. J. H. Tonge, who was awarded the Soane Medallion in 1894, and who selected parts of Holland and Germany for the scene of his tour, was unable to comply with the conditions which would entitle him to the second moiety of the sum of £100.

The Soane Medallist 1895.—The Council have approved the work executed by Mr. H. S. East [*A.*], who was awarded the Soane Medallion in 1895, and who travelled in Italy.

The Pugin Student 1895.—The Council have approved the work executed by Mr. Alfred J. Dunn [*A.*], who was elected the Pugin Student of 1895, and who travelled in the counties of Hereford, Gloucester, and Worcester.

The Owen Jones Student 1895.—The work executed in Sicily and other parts of Italy by Mr. Joass [*A.*], elected the Owen Jones Student of 1895, has met with the Council's unqualified satisfaction. Its excellent character has induced them to make special mention of it, and at the same time to offer Mr. Joass their hearty congratulations on the results of his travel and study.

In witness whereof the Common Seal has been

* A fifth application, supported by a testimonial, was also received, but it was unaccompanied by any "selection of "practical working drawings, or other evidence of special "practical knowledge." The applicant was Mr. Francis Masey [*Soane Medallist* 1887]. † Henry A. Crouch [*A.*].
‡ James Humphreys Tonge (York).

hereunto affixed this thirteenth day of January 1896 at a Meeting of the Council.—F. C. PENROSE, *President*; ASTON WEBB, *Vice-President*; WM. EMERSON, *Hon. Secretary*; EDW. A. GRUNING, JOHN SLATER; and WILLIAM H. WHITE, *Secretary*.

The Sixth General Meeting: The Presentation.

The General Meeting held 20th inst., which was well attended, was enthusiastic in its reception of the Chairman's Address, the Critical Reviews, and lastly, though not least, the students who had come from various parts of the country to receive the honours awarded to them. The drawings executed by the Tite Prizeman of 1894, the Soane Medallist, the Pugin Student, and the Owen Jones Student of 1895, during their respective tours, which were hung in the meeting-room, will remain on exhibition until 9 p.m. on Monday, 27th inst.

"The Architectural Literature of France" [pp. 145-157].

In a recent article reference was made [p. 150] to Mr. John J. Cole's gift of a quarto edition of Serlio's "Architecture," published at Venice in 1619, which contained MS. notes, and possessed in itself a history. Mr. Cole has now presented to the Library a rare quarto edition of Alberti's *L'Architettura*, published at Venice in 1565. Mr. William A. Pite [*F.*] has also presented a book of twenty-four plates by the Florentine Bartolommeo Rossi, entitled *Ornamenti di Fabriche antichi et moderni dell' Alma Citta di Roma*. The last plate bears the date of 1594, and the frontispiece that of the "year of jubilee" 1600. Both books, which are in their original bindings, are welcome acquisitions, and similar benefactors will confer a like favour by presenting a copy of any edition of *De Re Ædificatoria*, as Alberti wrote it, in Latin; and as it appeared in Florence towards the close of the fifteenth century. In the Bibliography, with which the article referred to terminated [pp. 156, 157], the fact that the asterisk prefixed to the title of a book indicated that it was not in the Institute Library was omitted to be stated.

REVIEWS. XXXVII.

(101)

GEOMETRICAL DRAWING.

Note-book on Plane Geometrical Drawing, with a Chapter on Scales, and an Introduction to Graphic Statics. By Robert Harris, Art Master at St. Paul's School. New edition, revised and enlarged. Fcp. 8o. Lond. 1895. *Price* 3*s.* 6*d.* [*Messrs. George Bell & Sons, York Street, Covent Garden, W.C.*]

Science and Art Drawing: Complete Geometrical Course, consisting of Plane and Solid Geometry, Orthographic and Isometric Projection, &c., &c. By J. Humphrey Spanton. 8o. Lond. 1895. *Price* 10*s. net.* [*Messrs. Macmillan & Co., 29-30, Bedford Street, W.C.*]

Nothing but admiration is due to students who, with no previous mathematical training, and with no assistance beyond that afforded by the ordinary textbooks, succeed in passing examinations in geometrical drawing. The ordinary textbooks consist of collections of problems, the ultimate object of which is the construction of a certain figure; and rules based on Euclidean principles are given for the solution of such problems, without the least hint of a reason for them, or a demonstration of their correctness. Each problem becomes an isolated item, to be committed to memory by rote; and if a link in the chain of construction be forgotten, there is nothing to guide the student to its recollection. The two books under notice do not differ in this respect from others of their class; but they differ considerably from each other in scope and character.

On the whole, it is to be feared that Mr. Harris's book cannot be recommended. It is a handy little volume, laid out on a good plan; and a careful student, fortified with a knowledge of the principles of pure geometry, could no doubt gain some assistance from it in preparing for an examination; but a student of ordinary intellectual attainments would most likely be hopelessly puzzled by it, and a negligent student very apt to be led astray. After a few sound, though trite, "introductory "hints" on drawing and the use of instruments, the author gives a collection of sixty "definitions." Some of these are open to criticism. No. 5, "A "vertical line is upright," for all the information it imparts, might as well be stated "an upright "line is vertical." In No. 13 we read, "Any one "side [of a triangle] may be called the base"—which the author certainly does not regard as true in the case of the isosceles triangle (*cf.* Props. 20, 21, page 16). No. 17, "A right-angled triangle "has one angle *equal to* a right angle," is oddly expressed. No. 45 is not a definition at all, but a statement of Euclid III. 31. More serious than the sins of commission are those of omission: notwithstanding the large number of definitions in this table, many technical terms are used in the course of the book for definitions of which one looks vainly. Even in the table of definitions the words "subtend" and "right figure" (whatever that may mean) are employed without adequate elucidation; while later on we find "harmonical "division," "harmonic mean," "ordinate," "abscissa," "parabola," "ellipse," "major and "minor axes," "hyperbola," to explain any of which the student is left to his own resources.

Geometry is a mathematical subject; and, though Mr. Harris does not profess to teach mathematics, we have a right to expect the definiteness and accuracy of expression for which that science stands pre-eminent. In Prop. 7 we are required to "measure the length of an arc," but no directions are given for effecting that operation. Prop. 10 tells us how to "divide a "space contained (!) between two parallel lines." Some of Mr. Harris's methods appear rather clumsy. Thus, according to him, the simple proposition, "From a point taken anywhere between

"two converging straight lines to draw a line "making equal angles with them," requires a portentous figure involving six straight lines and nine circular arcs. This may be good drawing, but it is very bad geometry. Mr. Harris has had the happy thought (as an examination of the figures seems to show) of indicating points assumed *ex hypothesi* by letters, constructed points by numbers. The increased number of available symbols ought surely to have obviated the necessity of giving such confusing directions as "Draw "line 2, 3 parallel to 1, 2"—two points being indicated by the figure 2. There is a serious omission in Prop. 24, "To find a point equi-"distant from the corners (!) of a triangle." We are told—

> Bisect two of the sides by lines meeting in point O. Point O is equidistant from the corners of the triangle.

As we are not told that the bisecting lines must be at right angles to the sides, it is clear that *any* point, within or without the triangle, would satisfy the solution as here given. Prop. 27 supplies us with another awkward ambiguity: it is required to "draw a right-angled triangle, two sides AB, "$2\frac{1}{2}$ inches, and BC, 1 inch, being given." We are left to deduce from the solution that AB is the hypothenuse. A very different triangle would of course be obtained were AB one of the other sides. Prop. 38 postulates ability to draw the tangent to a circle at any point of its circumference; but we are not told how to do this till Prop. 53.

This portion of the work improves, however, as we advance. A large section is devoted to inscribed and circumscribed figures of various kinds, and the construction of equal areas. A few elementary problems on the conic sections lead us to a section on cycloidal curves, which is headed by definitions of the cycloid and the trochoid with their varieties. But Problem 4 of this section is "To draw the 'chonchoid'" (*sic*), and Problem 5 is "To draw the cissoid": one has to discover from the solutions what these curves are, and also what the pole of a conchoid is. A useful little chapter on scales follows, preceded and followed by good collections of examples, principally selected from examination papers. In the next chapter, on "Geometrical Pattern Drawing," Mr. Harris is on firmer ground, and produces some very pretty figures by mathematical means. Chapters on Graphic Arithmetic and Graphic Statics, with a small muster of examples, conclude the book. In preparing future editions of his textbook, Mr. Harris should submit it to the revision of a mathematician; after undergoing this treatment it might take a very good place among treatises on geometrical drawing.

Mr. Spanton's goodly volume, viewed as a treatise on geometrical drawing, is excellent, and gives everything that a student would be expected to require for the examinations which it contemplates. It is no mere elementary introduction, but a good solid treatise on the subject, entering fully into its more abstruse branches, such as the projection of shadows and interpenetration. Faults of detail as well as of principle are not wanting, however; but these could easily be removed with a little care. In Prop. 15, for instance (an ingenious approximation, by the way, to that ancient Will-o'-the-wisp, the trisection of any angle), we find a sad lack of uniformity in the directions, "Join A "and C," "Join EI," "Join J with B," all of which indicate the same operation. Again, on p. 29 we have, "On the point A as centre," "From A as centre," and "With A as centre." Surely Mr. Spanton might have spared his readers the dreadful hybrids "duodecagon" and "hepta-"foil." A good many errors in strict mathematical accuracy may be noticed—*e.g.* the statement, "Tangents drawn to any three circles of different "diameters all meet in the same straight line"—in which it should be made clear that every pair of tangents is common to two of the circles. Problem 77, as stated, is an impossibility, analogous to the old crux concerning the smallest number of colours necessary to tint a map—"About a given circle A to describe six circles "equal to it *touching each other* as well as the "given circle." The reviewer had marked several similar blunders, but space prevents their being detailed at large: these will serve as examples. The pruning-hook of a mathematician would be useful in this case also. Further, in a work that professes to teach drawing at least quite as much as geometry, one would look for more artistic figures. They are generally accurate, but many are ungraceful, and nearly all are spoiled by ugly lettering; there is an unpleasing variation in the thickness of line employed; and some—notably fig. 108—are as glaringly "cooked" as ever were the productions of a schoolboy. The following direction—

> Do not stick pins into the middle of the board, because the points of the dividers are liable to slip into them (page 3)—

reads like a production of that interesting figment, the conventional stage Irishman.

These, however, are superficial faults, easily allowed for by the reader, and do not detract seriously from the merits of Mr. Spanton's book as a whole. R. A. S. MACALISTER.

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THE SCULPTURED STONES OF ISLAY.

The Carved Stones of Islay. By Robert C. Graham, F.S.A. Scot. (of Skipness). 4o. Glasgow 1895. *Illustrated with* 100 *engravings, chiefly on copper. Price* 31s. 6d. [*Messrs. James MacLehose & Sons, Publishers to the University, Glasgow.*]

The western highlands and islands of Scotland have been, from time immemorial, a rich field, not only for the secular or ecclesiastical historian, but

for the archæologist and the poet. Wave after wave of race has there left a marked deposit on the accumulated strata of time—in mythic legend, in monumental or architectural remains, or in written history. Scattered over the whole shores of Britain, including the Scottish Western Highlands, we first find the vestiges of the old Cave-dwellers. Then follow the evidences of that race to which are attributable the great unhewn stone monuments called Druidical remains—fabrics of supposed religious or political purpose. Next comes the era of sculptured stones, when the warrior, the huntsman, or the disciple of Christianity is recorded in effigy or by inscription. It appears that the habit of sculptured memorial stones, originally pagan, adapted itself to Christian faith and hope. The method of perpetuating the memory of the dead remained the same, the change in the symbolic sculpture showing, however, the great bound which had been made from pagan superstition to acknowledgment of Christian revelation.

Mr. Graham has produced a very attractive book—beautifully printed and illustrated, and rendered more interesting and valuable because the particular work of the volume is preceded by a descriptive epitome of the general and individual history of the Western Isles and their adjacent mainland. It is true that Pennant, Stuart, Drummond, and others visited, described, and delineated the principal and most striking objects under the head of Sculptured Stones, not only in Islay, but throughout Scotland; but Mr. Graham, by devoting his work solely to the Sculptured Stones of Islay, and accompanying that work with the local history beforementioned, and with maps, and routes, and topographical description, has done unique service to the antiquities of Islay, and to the recorded matter of that period of Scottish history in which sculptured stones form so large a part of the corroborative evidence of common tradition. Mr. Graham's minute description of the lesser stones and of the *disjecta membra* of others has done much to localise and contemporise the various types exhibited in these sculptures, and to preserve the fading memorials of bygone generations. I have high authority for believing that the sculptured stones of Islay belong entirely to the Christian epoch. Though they are, in respect of the larger specimens, essentially of the same type, they vary in localities as regards form, ornament, and excellence of device according to the ability, invention, and skill of the individual sculptor. The same authority leads me to believe that the smaller stones are but the marks of the humbler burial-places—more numerous and similar to each other where the ancient population has been thickest. But this adds interest to Mr. Graham's work, for in it we have, not only the Westminster Abbey, but the parish churchyard monuments of the far-off times of Islay.

These ancient stones relatively to each other resemble those which may be seen in any great burial-ground of the present day, where the great, the famous, or the wealthy are recorded in sumptuous edifices, bestowed by admirers, or purchased by their heirs, and which also contain the devout but humbler tributes of the personal affection of the poor.

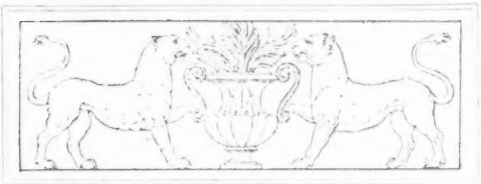
In common with man's handiwork in all ages destruction may casually overtake these sculptured stones; effacement must eventually be their lot, although, no doubt, such attention bestowed upon any monumental relics as that which archæologists have bestowed upon the sculptured stones of Islay must not only perpetuate their memory, but protect their duration *in situ* to the longest possible period. It is therefore gratifying to know that by such works as Mr. Graham's the whole sculptured stones of Islay have been placed in a single volume, and that future generations will find these stones, great and small, in actual portrait and distinct locality, whatever may have happened to the crumbling sculpture itself. He has done for Islay what others might do for all our parish burial-grounds or cathedral precincts—put down a complete record of what is there at present. Nothing more interesting could be done than for all parish ministers to make an inventory and description of the monumental remains within their parish bounds, and for the custodiers of every cathedral church or public edifice containing monuments, effigies, or portraits to do the same.*

Following up the labours of Pennant, of Stuart, and of Drummond, Mr. Graham has, after their great feast in Islay, gathered up the fragments that remained, so that nothing should be lost. If his book draws to these enchanting scenes new visitors, his would be the praise and theirs a pure and high reward. Knapdale, Islay, Iona, and Oronsay are treasure-houses of what lent nobility and sweetness to the troubled life of mortal man in distant ages, and contain the undoubted index to the sources of the national success of the Scottish people. These were the legendary lands of Fingal—the historic lands of St. Columba, of the Vikings, and of the great Scoto-Celtic race when that race was greatest; and to their monuments we can fitly apply the words of Ossian:—

"Beside the fount of mossy stones the weary
"heroes rest. The tear steals in secret from
"Annir. He broke the rising sigh: 'Here darkly
"'rest,' the hero said, 'the children of my youth.
"'This stone is the tomb of Ruro; that tree
"'sounds over the grave of Argon. Do ye hear
"'my voice, O my sons, within your narrow
"'house? Or do ye speak in the rustling leaves
"'when the winds of the desert arise?'"

Glasgow. JAMES GRAHAME.

* I speak feelingly, because I am aware that mural tablets and other monuments fall too easy victims to the *improvers* (!) of such buildings.—J. G.



THE ADMINISTRATION OF ART IN FRANCE. I.

By Antonin Barthélemy, Delegate of the Ministère des Beaux-Arts, Paris.

They say in France—The administration of the *Fine Arts*. It is an expression of which I never make use, because I consider it to be a very silly one. Art is art. It is a matter of inspiration and of technics, not of the material used. How can any one contend seriously that there are arts which have the privilege of being fine, and others the infirmity of not being so? But as we speak of France, we will say the *Fine Arts*. Let us be above everything accurate.

One of the eleven Ministries which in France are entrusted with the administration of the country is the Ministry of Public Instruction and Fine Arts. The official work of the department is in the hands of a certain number of directors, and there is a Director of Fine Arts who enjoys a greater amount of independence than his colleagues. But the direction of Fine Arts, which has lately undergone a change of far-reaching importance, has had a very strange fortune, which almost reads like a novel, and throws a considerable light upon the mischief caused by the excess of red-tapeism.

Before the Revolution of 1789 art was included in the administration of the royal buildings and the royal demesne. The first Republic made it a part of the Ministry of the Interior; the first Empire reduced it to nearly nothing. It expanded again after the Restoration; but the citizen king, in 1830, took it from the Ministry of the Interior to give it to the Ministry of Commerce and Public Works. In 1833 it was divided between the Ministry of the Interior and that of Public Instruction. In 1848 it was one with the museums. In 1853 it became part of the attributions of the Ministry of State, and, twelve years later, of the Ministry of the Imperial Household. In 1870 a Ministry of Fine Arts was formed, and was given, nobody knows why, the direction of the stud farms!

That Ministry, which had been created to reward the services of one of Napoleon III.'s most faithful followers, disappeared, of course, in the storm which swept over France. Art went back to the Ministry of Public Instruction, which some time after gave up the public buildings to the Ministry of Public Works, and placed the museums in a state of almost absolute independence, until 1871, when they were again brought under the control of the Fine Arts department. Since then the administration of Fine Arts has undergone numerous changes. Direction, General Direction, Under-Secretaryship of State, it has known the multifarious forms of officialism; but in that history, ludicrous in many ways, there is a bright spot. In 1881, when Gambetta was entrusted with the mission of constituting a Cabinet, which unfortunately proved the shortest lived of the numerous ministries of the Republic, he created a Ministry of *Art*, not of the Fine Arts, which truly deserves a few minutes' consideration.

"For nearly thirty years," says the report addressed by Gambetta to the President of the Republic, "foreign nations have multiplied the "institutions tending to foster the teaching of "art at all its stages and in all its applications, "and we have been able to see at the Universal "Exposition of 1878 how rapid, thanks to the "foresight of their Governments, has been the "progress realised in the art industries by nations "which formerly imitated us and now are our "rivals.

"The knowledge of that new development has "originated in France a movement of opinion in "favour of institutions which have everywhere "been followed by such prompt and important "results. Of all nations France was the first to "open technical schools. To the initiative of "the men of the Revolution are we indebted for "the museums and special classes which conse-"crate the alliance of art and industry. But it "has been very justly pointed out that in our "modern communities it is not enough to develop "the taste for, and the practice of, fine arts; and "that, economically and socially, art has a great "part to play in assisting industry and so trans-"forming the conditions of labour and influencing "in a decisive manner the productive forces of a "nation."

In a word, the Ministry of Art had the all-important mission of unifying and centralising the various agencies for technical instruction, from the lowest school to the *École des Beaux-Arts*. Its aim was to bring art and industry into a closer and every day more necessary contact; to redeem the task of the artisan from the opprobrium which had too long weighed upon it; to appeal in the name of the State to all the arts reconciled after so many years of unproductive misunderstanding; finally, not so much to give a direction as to establish a pact of confidence between private initiative and public action.

One of the most remarkable features of the recent and present history of this country—I mean England—is the movement, more pronounced as it goes, towards centralisation in all the various branches of public activity. England is the home of private initiative, and such a centralisation will not necessarily hamper it, but rather direct its efforts and prevent overlapping. The time is

drawing near when it will be found necessary to readjust the administrations which have here to do with art—museums, Department of Public Works, Science and Art Department. I do not, for my part, agree with the Incorporated Association of Head Masters, which proposed at their last meeting, according to the recommendation of the Royal Commission, to merge the Science and Art Department in the future central authority for secondary education.

A department of Art should, in my humble opinion, include, first, the schools of art from the lowest degree to the highest, and technical education should be made a part of that section. secondly, the museums. A time will come, I hope, when people will understand that no museum, be it ever so rich, is of the slightest value if it is not organised for education; if it is not so classified that one may come out of it with more knowledge, and not with the tired feeling which long rows of pictures, long lines of statuary, and overcrowded cases are apt to inflict upon the hapless visitor. Thirdly, the buildings, their construction and their decoration. There it will be necessary not to forget that the architect must be, as in the glorious days of old, in close contact and harmony with the artists entrusted with the decoration of his work, and that no good can come of making a building a field of competition between artists of different schools and styles.

But that is neither here nor there. My business is with France, not with England. As the French say, *Revenons à nos moutons*. Has the State a right to interfere with art? Even in France, where people rely so much on the State, there is upon that point a great divergence of opinion; some contest altogether such a right to the State. To put their arguments in a nutshell, they say that art needs freedom, that artists cannot breathe in an atmosphere of protection and red tape. I concede that the administration of art requires the greatest tact, and that the success of a director of art depends largely upon his personal qualities. But surely the State has a part to play in regard to art; I know of no country, be it ever so jealous of its freedom, where the State is not expected to help and to subsidise education, if it does not entirely control it. The more you extend the political franchise, the more you impose upon the State the duty to see that instruction is properly given to all who by their ballot-paper hold a part of responsibility in the making of their country's history. The State can and must give to those who wish and are worthy of it the means of educating themselves, of getting possessed of the knowledge which will allow them to rise in the profession to which they want to devote their lives. We shall see what should be the limits of the action in regard to the teaching of art. But upon the main point there cannot be any disagreement.

Again, the State is a curator. It is the trustee, the keeper of the treasures of art which belong to the nation. It has a plain duty in regard to museums, to the protection of artistic and historical buildings; nor can the necessity for its action here be denied.

Lastly, the State is a great public Builder. I believe that in this department its duty, as I tried to point out, is to promote that glorious collaboration between architects, painters, and sculptors which alone gave, and will give, the world monuments truly complete. The State does not always see it. There is no *esprit de suite* in matters which are too much left to take care of themselves. The great object in view is lost sight of, and it is the more to be regretted at a time when artists are, as perhaps they never were before to the same extent, perfect masters of their technics, when architects have developed a taste for decoration which is truly admirable.

Let us speak first of the State in France as a teacher of art.

There are in France numerous schools of art. Many are due to private initiative, and the State gives them grants which ought to be according to the results, for in that way only is progress fostered. But the State has not in France sufficiently recognised the importance of the teaching of drawing. As a matter of fact, the knowledge of drawing is every whit as important as the knowledge of writing. In the epoch-making address which he delivered in 1887 at Manchester, Huxley said: "In my judgment there "is no mode of exercising the faculty of observa- "tion and the faculty of accurate reproduction of "that which is observed, no discipline which so "readily tests error in these matters as drawing "properly taught"; and he added, "Nothing has "struck me more in the course of my life than the "loss which persons who are pursuing scientific "knowledge of any kind sustain from the difficul- "ties which arise because they never have been "taught elementary drawing." One hears a great deal at present about technical education. It cannot, I think, be denied, and all the inquiries made in the last few years show it plainly, that the nations which from a lower rank as manufacturers have come to the front are those where the teaching of drawing has been given its proper place. That teaching is necessary to all citizens, whatever avocations they pursue, and from the training schools which form the masters and mistresses it must make its way into all elementary schools. France sees it, and has made, in the last few years, real steps in that direction.

The present organisation of the National School of Fine Arts in Paris dates in the main from 1863. Previously there was a teaching which Count de Nieuwerkerke, Superintendent of Fine Arts, thus characterised: "The teaching is for the painters, "sculptors, and engravers nearly confined to a

"class in drawing, if one may so call short sittings "in which, during a few months every year, the "pupils draw from casts or from life under the "eyes of a professor who goes along the forms "making corrections. For the more advanced "pupils there is, besides, a class of anatomy. The "architects follow classes in mathematics, descrip-"tive geometry, architecture, history of art, and "construction. Finally, all the pupils follow lec-"tures on general history. It is noticeable that "most of the classes are sparsely attended. A "few do not even take place."

The decree of the 13th November 1863 was supposed to be a reaction against the preceding system. It was most certainly an improvement, as it opened new classes, made the museum more effective, and the library more useful. But it established studios in the school under the supervision of masters appointed by the Government, and that was a false and dangerous step. The State has a plain duty, that is, to diffuse the general teaching of art in order to awake vocations which are often ignorant of themselves. It goes beyond its proper mission when, trying to blend that wise method of general education with this or that system of individual teaching, it favours doctrines which have no real value, unless they are left to produce themselves in complete freedom.

Far from my mind to contest the usefulness of the School of Fine Arts, which was rendered more effective still when, in 1883, a new regulation introduced into the curriculum the teaching of those elements common to all arts. But I would like to see the State as impartial as it is in our human nature to be. Barye, the great sculptor, said one day: "We have a school where we are not con-"tent to teach the language of art; we teach also "how to use that language so as to be able to "express everything and compose everything ac-"cording to a geometrical disposition, so that, with "an excellent alphabet, all the words being placed "pyramidically, we obtain unintelligible sen-"tences." The State is justified in giving a general teaching which will enable the student to go in a condition of efficiency to those masters who best answer the impulses of his nature and his conception of art. The State is no more justified in teaching how to make a picture than it would be in teaching how to write a novel or compose a play.

London, 17th Jan. 1896.

THE AVERY MEMORIAL LIBRARY.

By Barr Ferree [*Hon. Corr. M.*, New York].

The most important endowment yet made in America for the diffusion of architectural knowledge and help to the study of architecture is that known as the Avery Architectural Library, a memorial library of architecture, archæology, and decorative art, in Columbia College, in New York. The architectural school of this college has long enjoyed a wide reputation at home and abroad as the leading school of its kind in America; and, like many of the departments of our American colleges, it began with a limited endowment and in a restricted manner. Under the capable guidance of Professor William R. Ware [*Hon. Corr. M.*], it speedily assumed a prominent place among the schools of its class; increased funds were placed at the disposal of its conductors, a working library was purchased, and within the past few years travelling scholarships were added to the advantages it offered its students, several of which have been richly endowed. In its architectural school, therefore, Columbia College possessed a powerful and active centre of architectural interest, and to this great advantage there has now been added another in the Avery Architectural Library.

The Avery Library is quite distinct in plan and in scope from the educational work carried on under the direction of the faculties of the college. The library in the school of architecture is a working library—a good, choice collection of necessary works supplemented by a vast collection of photographs. It is a library for the students, and makes no pretence to be other than this. The Avery Library, on the other hand, is a general reference library, wholly separate from the school library, and designed for the advanced student and the architect, instead of for the college undergraduate. And though its management is as distinct from that of the school as its situation in the general library building of the college, it nevertheless enormously increases the architectural resources of the college, and gives it, in this respect, a position quite unique among American institutions of learning, and a prestige which cannot but increase with each succeeding year.

Few subjects have been so difficult of study in America as the history of art, or, indeed, any phase of art which is recorded in a literature. The public libraries of America are not richly endowed, and the demand for costly art books has been limited, and their price very great in proportion to the use made of them. Since the Centennial Exhibition in Philadelphia, in 1876, opened American eyes to their artistic position, a new interest has been taken in artistic affairs, and librarians have found it necessary to respond, as best they could, to the demands made upon them for books on art. Yet of all the libraries in America, only one, prior to the founding of the Avery Library, possessed anything like a satisfactory collection of art books, employing that term to include standard and costly works whose price placed them practically beyond the reach of the individual student or architect. This was the Boston Public Library, which, about a year since, published a catalogue of its architectural books.

It is, perhaps, not necessary to add that the need of an extended architectural library in

America has been among the most pressing wants of our students. No other class of books is so costly; and it might almost be said no other is so necessary to the student. Attempts to found such a library, which would be a general storehouse of architectural knowledge, accessible to students from every part, have been made by one or two architectural organisations; the New York Chapter of the American Institute of Architects, for instance, having a library of its own, for the replenishing of which a special fund was started. This collection is not inconsiderable, though, from the absence of any extended endowment, it is far short of the collection in the Boston Public Library. The necessity for an architectural library, liberally endowed, wisely selected, and planned on the broadest principles, has therefore long been urgent in America.

This want has now been supplied through the liberality of two citizens of New York—Mr. and Mrs. Samuel P. Avery, who, in memory of their son, the late Henry Ogden Avery, have endowed a library of architectural and decorative art in Columbia College. The library was begun in 1890 with a gift of the books and drawings from the library of Mr. Henry O. Avery, with a money gift of $15,000 for the immediate purchase of books, and $15,000 additional to be invested as a permanent fund, whose income alone should be used for binding and repairs to books and further purchases. The endowment fund was afterwards increased to $25,000, and the original gift has been largely supplemented by Mr. Avery both in money and in books, many costly additions having been made to the volumes at frequently succeeding intervals, and long after the completed endowments were made.

As originally proposed, the collection was to be composed of books relating to architectural and decorative art; as afterwards developed, the widest possible construction was put upon the scope of the library, which now includes many notable books not coming under that head. From architecture it was but a step to archæology; from decoration it was hardly a step to sculpture. Proceeding on the broad field bounded by these arts, and keeping always in view the chief end of the library—a collection of books illustrating the fine art of architecture—a splendid collection has been gathered within the five years that have passed since the first gifts of its donators. The publication of the catalogue, which is now fresh from the Press—a superbly printed volume, whose cost has been generously borne by Mr. Avery—is not only a handsome testimonial of his liberality, but a valuable and useful memorial to his son. This collection is not only large in itself, as its catalogue testifies, but it is one of the really great architectural libraries of the world.

A library of the fine art of architecture it is, but it is rich in every phase of art; engraving and painting alone not being represented to any considerable extent, though both subjects are more or less illustrated. Some subjects which might properly be included are as yet but scantily represented. Such are engineering, drawing, and the more practical aspects of constructive architecture. Books on all these subjects are included in the present resources of the library, but it was deemed wiser—and to this there must be general assent—to expend the money available for those more costly works, essential to the architect and the student, which, owing to their great cost, could seldom be purchased by individuals. The library is therefore a storehouse of costly books, and its utility is the greater because of this.

It is not my purpose, in this brief notice, to summarise the literary and illustrative riches of this collection. In one respect it stands almost alone among the architectural libraries of the world: in the extent of its collection of architectural and archæological periodicals. Upwards of two hundred publications of this class are represented by complete sets; and in this respect, so far as my personal acquaintance with architectural libraries goes, it is only exceeded by the library of the Société Archéologique du Midi de la France, at Toulouse. It is richer than the Toulouse library in including many foreign publications other than French, but that library contains the publications of many French societies not represented in the Avery collection. It is quite impossible to estimate the value of the Avery Library in this respect to American students, since there is no other department of architectural literature in which American libraries are so deficient.

So far as the general scope of the Avery Library is concerned, it is necessary to add that it includes many books allied to its general subject, yet not directly included in it. Costume, furniture, numismatics, tapestry, heraldry, ceramics, textile fabrics, industrial arts, metal-work, arms and armour, and other artistic subjects not strictly architectural, are represented by many hundreds of costly volumes. Biographies of artists and architects, special church and county (English) histories, and much other valuable material that testifies to the breadth of view taken by the purchasers of the collection, are amply represented. Many rare and curious volumes are also included, with manuscripts and drawings; but the aim has been to provide useful, general, and monumental works, not a collection of bibliographic curiosities. In other words, the architect and the student can now find in New York almost every important book bearing upon the historical aspects of the fine art of architecture, in a library conducted in the interests of students, with great freedom of access, and within convenient reach. It is not too much to say that the placing of this collection within the reach of those interested in its subject is the most valuable service yet rendered to the art of architecture in

America, and its founders have placed the architectural public of our country under lasting obligations by their munificent memorial to their son.

Young Mr. Avery, in whose memory this library has been founded, was born in Brooklyn, New York, in 1852. His early architectural education was obtained in the drawing schools of the Cooper Union, in New York, and subsequently in the office of Mr. Russell Sturgis. Between 1872 and 1879 he studied in Paris, at the École des Beaux-Arts, and on his return to America entered the office of the late Richard Morris Hunt. In 1883 he opened an office for himself, and followed the practice of his profession until his death on April 30th, 1890. His earliest surroundings were of an artistic nature, and in the library that bears his name he has received a worthy and magnificent memorial.

The conduct of the library has been committed to a Commission, composed of the Librarian of the college (Mr. George H. Baker), the Professor of Architecture (Mr. William R. Ware), and Mr. Russell Sturgis; and with the two former is lodged the power of selecting the third member in the event of the retirement of Mr. Sturgis, it being stipulated that his successor shall always be an architect not connected with the college. The value of the collection, so far as the selecting of books is concerned, has depended upon their disinterested labours, and to them, not less than to Mr. and Mrs. Avery, the architects of America owe a lasting debt of thanks for the ability and discretion with which they have discharged the trust committed to their care.

New York, 10th Jan. 1896.

NOTES, QUERIES, AND REPLIES.

EXPERIMENTAL RESEARCH.

"Sound in its Relation to Public Buildings."

A Paper on this subject, by Mr. H. W. Burrows, was read before the Institute last March, and published in the JOURNAL [Vol. II. pp. 353, 423]. In the discussion of it Professor T. Roger Smith urged that the Science Standing Committee should endeavour to collect and record further information on the subject. It is suggested that members of the Institute, residing as they do in all parts of the country and abroad, might facilitate this inquiry by undertaking to study at least one public building in their immediate neighbourhood, with regard to its acoustic properties. It would also be desirable that the inquirers should associate themselves for the purpose with musicians and speakers who are in the habit of using the buildings, varying opinions often being expressed upon the merits or demerits of the same building, dependent upon the purpose to which it is devoted. It is hoped that the Allied Societies will especially urge their members to aid in this research. If a sufficient number of members be willing to assist, it is proposed, in order to insure uniformity and simplicity in the classification of results, to issue a Schedule of questions indicating the lines on which the inquiry should be based; among them would be the following:—

1. A sketch plan, section, and elevation of the interior should be given, or references made to measured drawings or descriptions of the building, especially those describing it with regard to acoustics, and when possible the name of the architect.

2. The materials used in the construction, and the furniture and fittings should be described.

3. The position of seats, relation of speakers to hearers, and the effect of an audience should be noticed.

4. The ventilation, lighting, and warming, and their effect on sound should be carefully noted.

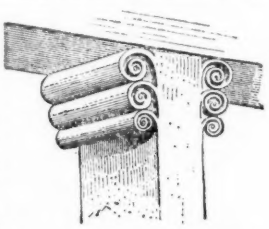
5. It should be stated if the building is generally considered good or bad, for music or for speaking.

Other minor points might be noticed and added to the Schedule, which will be forwarded to any who are willing to assist in the inquiry, and who are requested to send their names to the Honorary Secretaries of the Science Committee, at the office of the Institute.

DR. RICHTER'S PAPER [pp. 109, 163].

Viollet-Le-Duc and the Origin of the Volute.

Viollet-Le-Duc, in his second *Entretien*, which treats of primitive buildings anterior to the Greek epoch, refers to the early architecture of peoples in remote parts of the East—the common source, he adds, of all the arts—and then, after quoting Vitruvius (Bk. ii. ch. 3), says: *



"L'imitation de la "construction de "bois apparaît même dans les plus menus détails "de ces édifices primitifs d'Orient. Ainsi on "voit fréquemment au sommet des piliers des "rouleaux superposés, présentant la décoration "reproduite dans la figure. N'est-il pas évident "que ces rouleaux ne sont autre chose que les

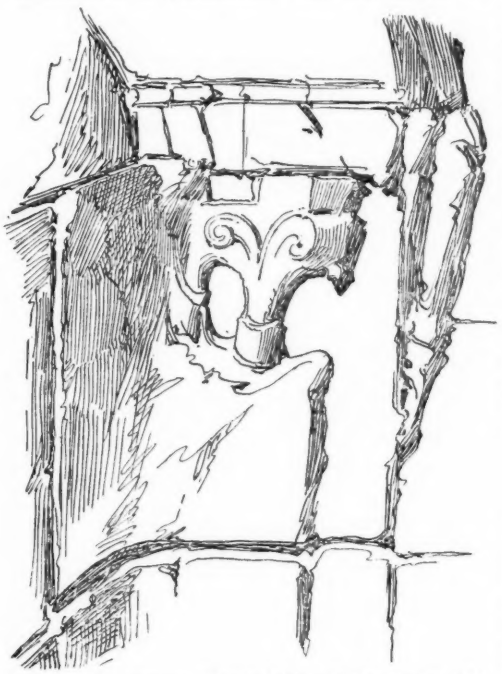
* The translation of this extract, given by the late Mr. Bucknall in his edition of Viollet-Le-Duc's Lectures (Vol. I. p. 42), is as follows:—"The imitation of construc-"tion in wood appears even in the minutest details of "these primitive edifices of the East: for instance, we "frequently see at the tops of pillars a succession of rolls "one over the other, presenting a decoration of the cha-"racter shown in the figure. Is it not evident that these "rolls are nothing more than the curled chips cut from "the wooden post by the carpenter in the process of "squaring it?"

" copeaux enlevés du poteau de bois par le charpen-
" tier, qui veut l'équarrir ? " Viollet-Le-Duc, who always took the practical, and never the sentimental, view of origin in architectonic forms and ornament, evidently had the volute in his mind when he wrote the sentence quoted above and made the sketch to illustrate his meaning. It would therefore be interesting to know, from the experience of members and others, to what buildings in Asia Minor and the further East Viollet-Le-Duc refers, as bearing rude decoration of the character shown in the diagram.

The Ionic Volute : An example at Jerusalem.

From WILLIAM SIMPSON [*H.A.*], R.I.—

In calling attention to the pilaster and volute from Tell el Hesy [p. 164], I quite forgot at the moment another example of what I believe is a similar form in Jerusalem. This also is due to



Volute Capital, Jerusalem. (From a sketch by William Simpson, R.I.)

the labours of the Palestine Exploration Fund, and forms part of the remarkable series of discoveries, in what was then termed " Underground " Jerusalem," which were made by Sir Charles Warren, then known as " Captain Warren," when he carried on operations for the Fund, now over a quarter of a century ago. I visited Jerusalem in the early part of 1869, and had the privilege of going over these explorations at that date with the distinguished explorer. At the Gate of the Chain—one of the entrances to the Haram—there is a series of underground arches, the first of which was discovered by Sir Charles Wilson, and is now known as " Wilson's Arch ; " the others were, I understood, discovered by Warren. The rubbish of many centuries had gathered in these underground vaults, and I remember crawling over heaps of filth, and through dark, narrow holes, as if we had been rats. This was to reach an arched apartment, which Warren, with his tendencies as a " Craftsman," had dubbed the " Masonic Hall." This name was suggested by a pedestal and portion of a pillar still standing visible out of the accumulated rubbish. In one corner of this I sketched what appeared to be an unfinished capital, of which a pen-and-ink copy is here given. With the Tamassos Volutes, and the one from Tell el Hesy before us, I think there can be no doubt but this Jerusalem example belongs to the same style. Here is Warren's own description of it : " At each corner there were pilasters " with capitals, but that at the north-east angle " alone is in a moderate state of preservation."* In a later work† he describes the hall as being " built with large drafted stones, pilasters at the " angles inside, surmounted with carved Ionic " capitals." In this book the writer attributes the construction to the period of the Maccabees. So far as I recollect, these pilasters were not at the sides of doors, as in the examples from Cyprus, but were at the corners of the hall ; a point of importance, showing that this particular form was not limited to door-jambs. In this Jerusalem example the form is also decorative like the others ; and whatever may be the origin of this volute, which is found all the way from Cyprus to Lachish, a very long period must be allowed to account for its change from a constructive to an ornamental character.

Dr. Richter's Researches in Cyprus [p. 158].

Exigencies of space necessitated somewhat free excision of Dr. Richter's notes in the last issue [p. 158], on British and German research in Cyprus, with a result perhaps a little unfair to the author. Dr. Richter desires it to be known that Germany has not enjoyed a monopoly of his labours in the exploration of the island. His first excavations (1879-81) were carried out for the late Sir Charles Newton, then Keeper of the British and Roman Antiquities at the British Museum. In 1881 he was employed by the Government in the Forest Department, and superintended the works for replanting. In 1882-83 he conducted excavations for the British Museum, and for the Cyprus Museum, then just founded. In 1885 a pick-and-shovel expedition on his own account resulted in the discovery of the Attic colony near

* *The Recovery of Jerusalem*, 1871, p. 89. There is an illustration of the capital in the volume.

† *Underground Jerusalem*, 1876, p. 370.

Poli tis Chrysokhou, and the sites of Marion and Arsinoë. In the following year he was again at work for English residents, and the important discoveries then made suggested the formation of the Cyprus Exploration Fund. His subsequent work for the Berlin Museum and the German Emperor have occupied but a small part of his archæological career. Dr. Richter mentions that, before he left Cyprus last July, he secured the digging rights of sites hitherto entirely unexplored, including an unknown ancient town and three sanctuaries. On one of these spots a Cyprian syllabaric inscription was found, giving particulars of the rules and regulations of a temple.

THE LONDON BUILDING ACT 1894.

Appeal to County Court from the Award of Surveyors.

From WILLIAM WOODWARD [*A.*]—

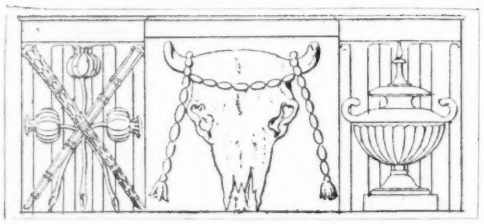
I believe it is exceedingly rare that an award of two surveyors under section 91, sub-section 2, has been appealed against by the other of the three surveyors, and the following case may therefore be of interest to members of the Institute.

The sub-section above mentioned is similar to that in the old Act, and is as follows :

> Any award given by such one surveyor or by such three surveyors, or by any two of them, shall be conclusive, and shall not be questioned in any court with this exception, that either of the parties to the difference may appeal therefrom to the county court within fourteen days from the date of the delivery of the award, and the county court may, subject as hereafter in this section mentioned, rescind the award or modify it in such manner as it thinks just.

In the present case the usual party-wall notices had been properly served, and a Fellow of the Institute appointed as the third surveyor. I was acting for the adjoining owner, and the surveyor to the building owner had given notice to take down and rebuild a party-wall, he desiring to raise upon the wall, which would then be insufficient to carry the extra weight, and he appeared to be quite willing to bear the whole expenses of the rebuilding. When, however, the award was drawn by the third surveyor, I found that he had worked under section 95, sub-sec. 1 (*a*), which provides for the expenses to be borne *jointly* by the building owner and adjoining owner, and of course the surveyor to the building owner very readily joined the third surveyor and signed the award; but when it was passed on to me for signature, I declined to be a party to it, on the ground that sec. 95, sub-sec. 2 (*b*) was the right section, which provides for the *whole* of the expenses to be borne by the building owner.

I then commenced proceedings under section 91, sub-section 2, and the case was heard last year at the Clerkenwell County Court, with the result that the Judge rescinded the award of the two surveyors, and ordered the building owner to pay all costs.



MINUTES. V.

At the Fifth General Meeting (Business) of the Session, held Monday, 13th January 1896, at 8 p.m., Mr. F. C. Penrose, F.R.S., *President*, in the Chair, with 14 Fellows (including 7 members of the Council) and 26 Associates, the Minutes of the Meeting held 16th December 1895 [p. 139] were taken as read and signed as correct.

The Secretary announced the decease of John Thomas Newman, *Fellow*; and Thomas Wells, *Associate*.

The Secretary referred to recent donations to the Library, and an expression of the thanks of the Institute to the several donors was ordered to be entered on the Minutes.

The following Associates, attending for the first time since their election, were formally admitted, and signed the Register, namely:—William Adam Forsyth, Herbert Phillips Fletcher, Ernest Edward Fetch, and Robert Saxton Besant.

The following candidates for membership in the various classes were elected by show of hands, namely:—

As Fellow.

ROBERT WILLIAMS [*A.*] (*Qualified as Associate* 1887).

As Associate.

CHARLES JAMES HAIR (*Qualified* 1895).

As Hon. Corr. Members.

Baron ALBERT VON LECOQ (Darmstadt).
FREDERICK SKJOLD NECKELMANN (Stuttgart).

The President announced that, by a resolution of the Council pursuant to the terms of By-law 20, and in accordance with the provisions of By-law 23, the following Associates had ceased to be members of the Royal Institute—namely, Alexander Bleakley and George Eastlake Thoms. The President further announced that, by a resolution of the Council pursuant to the terms and provisions of the By-laws above-mentioned, the following Associate had been suspended until further notice from membership of the Institute—namely, Colvile Browne.

The President having read the Deed of Award of the Prizes and Studentships 1896, made under the Common Seal [pp. 181–83], the sealed envelopes bearing the respective mottoes or devices of the successful competitors were opened, and their names and addresses found to be as follow:—

THE ROYAL INSTITUTE SILVER MEDAL (Essays).

A Priori.—Banister F. Fletcher [*A.*], 29, New Bridge Street, Ludgate Circus, E.C. (The Silver Medal and Twenty-five Guineas).

Conditioned.—John J. Cresswell [*A.*], Victoria Chambers, Grimsby (Books of the value of Five Guineas).

John Bull.—Edward Albert Jollye, 29, Trevor Square, S.W. (Honourable Mention).

THE ROYAL INSTITUTE SILVER MEDAL (Drawings).

Grlielmvs.—Hugh P. G. Maule [*Probationer*], Altair, Sutherland Road, Ealing, W. (The Silver Medal and Ten Guineas).

"*X.*"—Cyril Wontner Smith [*Probationer*], 34, Woodberry Grove, Finsbury Park, N. (Medal of Merit and Five Guineas).

THE SOANE MEDALLION.

Ad Finem.—R. Shekleton Balfour [*A.*], 76, Inverness Terrace, W. (The Medallion and, under conditions of foreign travel, £100).

Thor.—John Anderson [*A.*], 4, The Mall, Haverstock Hill, N.W. (Medal of Merit).

Bow Bells.—Edwin Alfred Rickards, 125, High Street, Putney (Honourable Mention).

THE TITE PRIZE.

Australis.—Henry A. Crouch [*A.*], 35, Bernard Street, Russell Square, W.C. (The Certificate and, under conditions of Travel in Italy, £30).

THE GRISSELL MEDAL.

Zampa.—James Humphreys Tonge, East View, Haxby Road, York (The Medal and Ten Guineas).

The proceedings then terminated, and the Meeting separated at 8.45 p.m.

MINUTES. VI.

At the Sixth General Meeting (Ordinary) of the Session, held Monday, 20th January 1896, at 8 p.m., Mr. Alex. Graham, F.S.A., *Vice-President*, in the Chair, with 24 Fellows (including 12 members of the Council), 43 Associates, 1 Hon. Associate, and 59 visitors, the Minutes of the Meeting held 13th January 1896 [p. 192] were taken as read and signed as correct.

The following Associates, attending for the first time since their election, were formally admitted and signed the Register, namely:—John James Cresswell (Grimsby), William Charles Waymouth, Charles James Hair, and Robert Messenger.

The Chairman announced that the Council, on behalf of the Institute, had resolved to take the most active steps in their power to preserve the Church of St. Mary Woolnoth from the destruction with which it was threatened—the said church being an architectural monument of the highest merit, and in its particular position an adornment to the City of London. Also that the President had been requested to attend the Public Meeting to be held at the Mansion House on the 22nd January to oppose the scheme of destruction; and support on behalf of the Institute any Resolution for the retention of the church. The Chairman added that any members able to attend the Meeting were requested to do so, and assist the President.

The Chairman delivered an Address to students [p. 169]; after which Mr. William Young [*F.*], Mr. Frank T Baggallay [*F.*], and Mr. Beresford Pite [*A.*] delivered criticisms of the Designs and Drawings submitted for the Prizes and Studentships 1896 [171–81].

The Chairman made the following presentations, in accordance with the Deed of Award [pp. 181–83], namely:—

ASHPITEL PRIZE 1895 (Examination qualifying for Candidature as Associate): The Prize not awarded. Books value Five Guineas respectively to Mr. GEORGE JOHN THRIFT REAVELL [*A.*] and Mr. WILLIAM CHARLES WAYMOUTH [*A.*].

TITE PRIZEMAN 1894: Cheque for £10, being second moiety of the £30 for travel, to Mr. ALEXANDER ROBERT HENNELL [*A.*].

SOANE MEDALLIST 1895: Cheque for £50, being second moiety of the £100 for travel, to Mr. HUBERT SPRINGFORD EAST [*A.*].

PUGIN STUDENT 1895: Medal and cheque for £40 to Mr. ALFRED JOHN DUNN [*A.*].

OWEN JONES STUDENT 1895: Certificate and cheque for £25, being second moiety of the £50 for travel, to JOHN JAMES JOASS [*A.*].

The Chairman then proceeded to present the Prizes and introduce the Travelling Students for 1896, in accordance with the Deed of Award [pp. 181–83], namely:—

ROYAL INSTITUTE SILVER MEDAL AND TWENTY-FIVE GUINEAS (Essays): to Mr. BANISTER FLIGHT FLETCHER [*A.*], for Essay on "The Influence of Material on Architecture" under motto "A Priori."

Books value £5. 5*s.* to Mr. JOHN JAMES CRESSWELL [*A.*], for Essay under motto "Conditioned."

Certificate of Honourable Mention to Mr. EDWARD ALBERT JOLLYE, for Essay under motto "John "Bull."

ROYAL INSTITUTE SILVER MEDAL AND TEN GUINEAS (Drawings): to Mr. HUGH PATRICK GUARIN MAULE [*Probationer*], for his drawings of Hampton Court Palace, under motto "Gvlielmvs."

Medal of Merit and cheque for £5. 5*s.* to Mr. CYRIL WONTNER SMITH [*Probationer*], for his drawings of Gedney Parish Church, Lincolnshire.

SOANE MEDALLION and, under conditions of foreign travel, One Hundred Pounds: awarded to Mr. ROBERT SHEKLETON BALFOUR [*A.*], *Inst. Medallist* (*Drawings*) 1892, *Pugin Student* 1894, *Tite Prizeman* 1895, for his design for an Institute of Architects, under motto "Ad Finem."

Medal of Merit to Mr. JOHN ANDERSON [*A.*], for his design under motto "Thor."

Certificate of Honourable Mention to Mr. EDWIN ALFRED RICKARDS, for his design under motto "Bow Bells."

PUGIN STUDENTSHIP (Medal and £40): awarded to Mr. CECIL CLAUDE BREWER.

OWEN JONES STUDENTSHIP (Certificate and £50): awarded to Mr. HUBERT CHRISTIAN CORLETTE [*A.*].

GODWIN BURSARY (Medal and £40): awarded to Mr. ALEXANDER NISBET PATERSON [*A.*], M.A.

TITE PRIZE (Certificate and, under conditions of Travel in Italy, £30): awarded to Mr. HENRY ARTHUR CROUCH [*A.*]

GRISSELL MEDAL AND TEN GUINEAS: awarded to Mr. JAMES HUMPHREYS TONGE, *Soane Medallist* 1894.

ALDWINCKLE STUDENTSHIP (£50, under conditions of Travel in Spain): awarded to Mr. HUBERT SPRINGFORD EAST [*A.*], *Soane Medallist* 1895.

A vote of thanks to the Chairman having been passed by acclamation, the proceedings terminated, and the Meeting separated at 10 p.m.

The York Society.

The following are the recently elected office bearers for the year 1895-96:—President, Mr. H. Perkin [*F.*]; Vice-Presidents, Messrs. J. Lane and A. W. Turner; Council, Messrs. G. Benson, A. H. Claypoole, A. Hirst, J. T. Pegge, and J. Ferguson; *ex-officio* members of the Council, Messrs. W. G. Penty [*F.*], William Hepper, and Arthur Pollard; Treasurer, Mr. Norman R. Yeomans; Librarian, Mr. W. E. Walker; Hon. Secretary, Mr. A. B. Burleigh.

The Glasgow Institute.

The following are the recently elected office-bearers for 1895-96:—President, Mr. T. L. Watson [*F.*]; Vice-President, Mr. J. J. Burnet [*A.*], A.R.S.A.; Auditor, Mr. Campbell Douglas [*F.*]; Hon. Treasurer, Mr. Alex. Petrie; Secretary, Mr. C. J. MacLean, Writer; members of the Council, Messrs. T. L. Watson [*F.*], Alexander Petrie, John B. Wilson [*A.*],

J. M. Monro, A. G. Thomson, John Thomson, J. J. Burnet [*A.*], J. A. Morris [*F.*] (Ayr), George Bell, David Barclay, and Alex. McGibbon [*A.*].

PROCEEDINGS OF ALLIED SOCIETIES.

THE MANCHESTER SOCIETY.

Westmorland Slates: Their Geology, Chemistry, and Architectural Value.

By J. J. Thomas, Kendal.

Read 7th January 1896.

So far as I am aware, it is seldom that slates and slate-quarrying form the subject of a Paper to be read before an Architectural Society, and I wish to say at the outset that the opportunity now afforded of placing on the records of this important Society some account—imperfect though it be—of Westmorland slates is one which I highly appreciate.

It will be generally admitted, I believe, that slates deserve to be classed among the most important materials with which the architect, during the course of his professional career, has to deal; but it is doubtful whether the same scientific study has been made of them as of many other articles used in architectural work. It may be interesting at this point to give some idea of the magnitude of the industry which we have under consideration, and the quantity of slates produced in this country. I find from official statistics that about 15,000 men are employed in the slate quarries of Great Britain and Ireland; and that they produced, in 1894, 461,673 tons of slates, amounting in value to £1,171,366; out of this total £940,553 worth were used in this country, the remainder being exported to various foreign countries, a list of which, with the quantities sent to each and their values, I append to this Paper. It is also interesting to note that the slate trade comes fourth on the list of those industries tabulated in the mineral statistics of Great Britain and Ireland. Coal comes first, the value in 1894 being £62,730,179; stone, £7,695,716; iron ore, £3,190,647; slates, £1,171,366.

From the foregoing figures it will be seen that the slate industry in this country is one of very considerable magnitude, and represents in money value a large annual turnover.

In order to make the Paper easy to follow and as intelligible as possible, I propose to deal with the subject under three main headings:—

1. The Geological Position and Extent of the Slate-producing Area of the Lake District.

2. The Chemical Composition of Slates, and the Action upon them of Impure Atmospheres and varying Degrees of Temperature.

3. General Description of Westmorland Slate-Quarrying, the Method of preparing the Slates, Cleavage, Architectural Value.

The Geological Position and Extent of the Slate-Producing Area of the Lake District.—The Lake District proper is composed of Silurian strata, both the lower and upper divisions of the formation being represented, and they may be divided into five groups, which I give in order of deposition, viz.:—

Skiddaw Slates, 7,000 feet	Lower Silurian.
Green Slate and Porphyry Series, 7 to 10,000 feet	
Coniston Limestone, 300 feet	
Coniston Flags and Grits, 7,000 feet .	Upper Silurian.
Ludlow Rocks, 5,200 feet . . .	

From the above table it will be seen that the Skiddaw Slates, which comprise a group of rocks of enormous thickness, and cover an area of about 200 square miles, form the base of the Lower Silurian series of the Lake District, and have their equivalent in the Arenig Slates or Lower Llandeilo Flags of North and South Wales.

The group mainly consists of dark slates or slaty mud stones, with occasional beds of harder material of a flaggy nature, but almost devoid of cleavage. Some geologists describe the Skiddaw Slates as of little industrial importance: so far as slates are concerned, this may be correct, as, with the exception of Bowscale Fell and Embleton Valley Slate Quarries, both of which, I believe, are now idle, no roofing slates are obtained from this group. But several important, and at one time lucrative, mineral deposits were worked in this formation, among which may be mentioned the famous Goldscope Mine, which produced in former years both gold and copper, the latter, it is said, in large quantities. A number of other mines produced lead, copper, iron, and cobalt. It may also be stated that good flags have been quarried at Crummock, and near Shap slate pencils were once largely produced.

Lying conformably on the Skiddaw Slates are the Green Slate and Porphyry series, also of Lower Silurian age, their equivalent in the Silurian Rocks of North and South Wales being part of the Bala Beds, the whole of Llandeilo, and probably part of the Arenig formation.

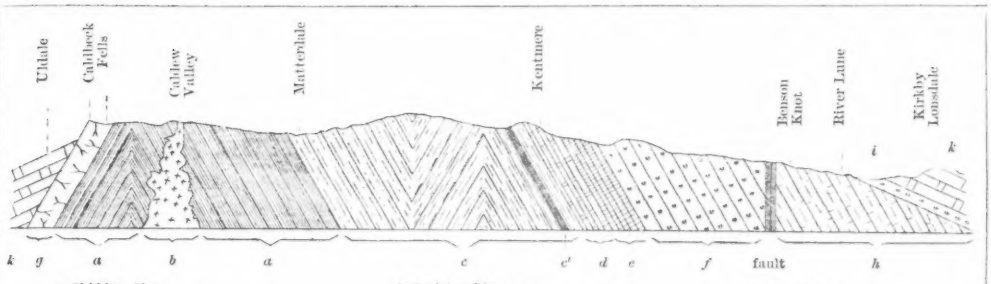
It need hardly be mentioned that this group of rocks is one presenting many points of considerable interest, and has for years attracted the attention of some of our leading men of science, several of whom have placed on record, at considerable length, the result of their investigations; and, although it would be extremely interesting to follow some of these geological pioneers in the study of these rocks, I shall only briefly notify their chief geological features, and proceed more especially to deal with them as slate-producing rocks, as it is from this formation that all the Westmorland green roofing slates of commerce are obtained.

The group is one of great superficial extent, extends twenty-five miles in an E.N.E. and W.S.W. direction, and averages about thirteen miles in a N.W.W. and S.S.E. direction; covers an area of about 325 square miles, and attains a thickness of about 10,000 feet. It is composed of a vast accumulation of bedded felspathic ashes and breccia, with alternate beds of porphyries of considerable thickness. The whole group, which is entirely devoid of fossils, except a small band near the top, is the result of a series of volcanic actions, estimated to have spread over a period of about one and a half million years. The chief centres of this volcanic activity are supposed to have been Ambleside and Keswick, in addition to which there were several other smaller centres of irruption in various parts of the district.

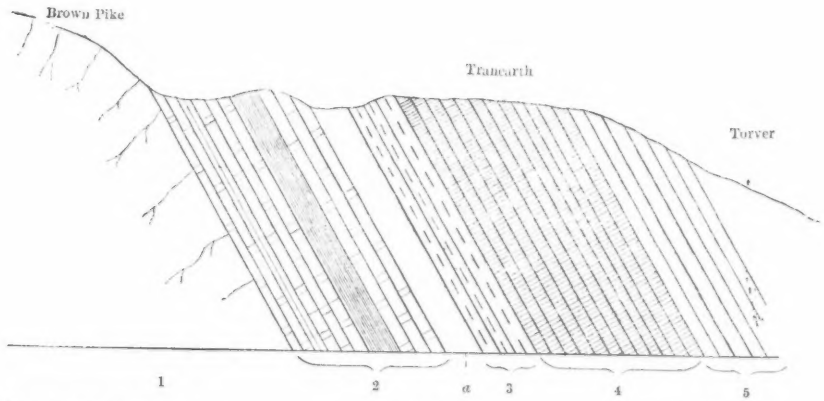
The volcanic activity which commenced at the close of the Skiddaw Slate period is not supposed to have been marked in its earlier stages by any general upheaval of rocks. In all probability the earlier volcanic outbursts were submarine, as the rocks at Eycott Hill, near Black Coombe, and also in an exposure near Shap, seem to point to the conclusion that the lower deposits, although in all probability thrown high above the water, fell back and were interstratified with deposits of mud and sand. Later in the period, however, it seems clear that the volcanic action was accompanied by a gradual upheaval of the old ocean bed.

Turning now to the series, and examining it from a quarrying and slate-producing point of view, I think it may be safely stated that it presents more difficulties and complications than any other slate-producing formation on the geological chart. Out of the whole 325 square miles which this group covers, there are only about twelve or fourteen beds from which slates are obtained. Ten or twelve of these are situate near the top of the series in the Coniston district, and the remainder at the base of the series in the neighbourhood of Keswick. The whole area between these two points is practically barren of any rock sufficiently well cleaved to produce roofing slates.

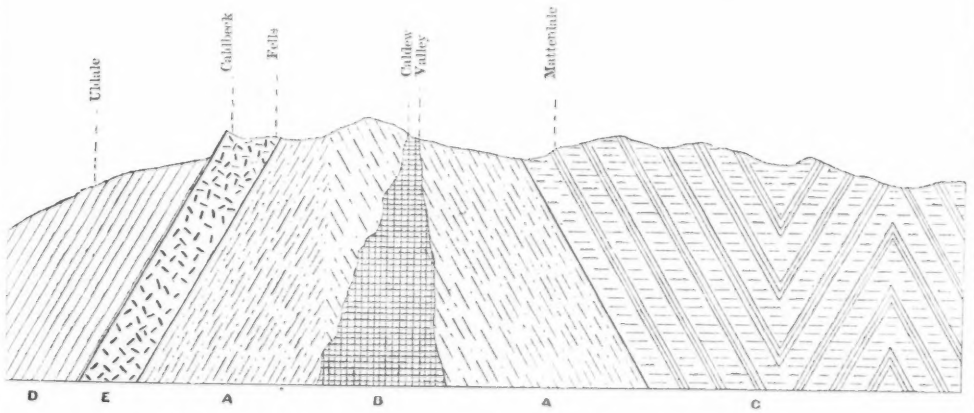
It may be pointed out here that the fine ash beds from which the slates are obtained are in each case in close proximity to where the main centres of eruptions are sup-



a, Skiddaw Slates.
b, Granite of the Caldew Valley.
c, Green Slates and Porphyries.
c', Fossiliferous Band near top of *c*.
d, Coniston Limestone.
e, Coniston Flags.
f, Coniston Grits.
g, Felspathic Traps (G. S. and P. Age).
h, Ludlow Rocks.
i, Upper Old Red Sandstone.
k, Carboniferous Rocks.



1, Green Slates and Porphyries.
2, Coniston Limestone and associated shales.
3, Gray Grits.
4, Coniston Flags.
5, "Sheerbate" Flags.
a, Probable position of black Graptolite shales.



A, Skiddaw Slates.
B, Granite of the Caldew Valley.
C, Green Slates and Porphyries.
D, Carboniferous Rocks.
E, Felspathic Traps of the Caldbeck Fells, the equivalent of the Green Slates and Porphyries.

posed to have been located, and this may point to a period of less violent volcanic activity than when the porphyries and breccias were emitted.

Accompanying the fine ash beds are almost invariably found beds of breccia, also cleaved, but generally too rough and coarse in the grain to make marketable roofing slates. One of the principal difficulties to contend with in this series is the uncertainty of the continuity of the bed of slate, from the fact that there is a marked difference between a volcanic deposit and a sedimentary formation. The former is not only subject to considerable variation in the character as well as in the degree of fineness of its deposit, but also in its extent; while, on the other hand, sedimentary formations, such as occur in North Wales, have been formed under deep sea, and during a period of comparative calmness. You will therefore readily understand why a sedimentary bed is much more regular than a fine ash bed emitted from the crater of a volcano.

Coniston Limestone.—The Green Slate and Porphyry series is overlaid by the Coniston Limestone, a narrow band averaging about 300 feet in thickness, and extending from Millom to Wasdale Crag, near Shap. This is considered to be the equivalent of the Bala Limestone of North Wales, and is the topmost bed of the lower Silurian Rocks of the Lake district. It consists of hard and compact limestone of a dark blue colour, and is largely intermixed with cleaved slates. It is of little or no commercial value.

The Limestone is succeeded by the *Stockdale Shales*, a narrow group of Graptolitic mudstones, with bands of dark and purple shales, forming the base of the Upper Silurian of the district. On Torver and Broughton Moors several attempts have been made at quarrying these shales for slates and flags, but hitherto the discoveries have not been of an encouraging character.

Lying on the Stockdale Shales are the *Coniston Flags and Grits*, which are precisely the same as the Denbighshire Grits and Flags overlying the Tarranon Shale in North Wales. The lower bed – the flags – attains a thickness of about 2,800 feet, while the grits measure 4,000 feet in thickness. The flags consist of dark blue sandy mudstones, which when cleaved are largely quarried for slates and flags, the principal quarries in this series being on Torver and Kirkby Moors. The grits are composed of harder material, principally gritty sandstones with interstratified beds of slates and flags. These bring us to the *Ludlow Rocks*, an extensive group of fossiliferous rocks extending from Kendal to the Lune Valley, and, as will be seen from the section, are of the same geological age as the formation bearing the same name in North Wales.

The above brief outline of the geology of the slate formations brings us to the next heading – viz.: —

The Chemical Composition of Slates, and the Action upon them of Impure Atmospheres and varying Degrees of Temperature.—However interesting and valuable may be the inquiry into the geological history and relative age of the various slate-producing rocks, and the manner in which they have been formed, it is possible that from a utilitarian point of view the chemical analysis of the slates, and the effect varying degrees of temperature, &c., have upon them, is equally, if not more, important to us.

There is probably no article of domestic use with which we are more familiar and have more prominently brought before us than a slate; even from our earliest schooldays we were brought face to face with this useful article of commerce. It is, however, doubtful whether many, even of those who most frequently use them, have thought it necessary and of sufficient importance to inquire into the characteristics and relative values of the different kinds of slates.

It is a remarkable fact that although, as will be readily admitted, there is a great difference in the "wearing" quality of the various descriptions of slates, the variation in the chemical compositions is exceedingly slight. I will give the analyses of some of the principal varieties of roofing slates.

1. *Analysis of ordinary blue Welsh roofing slate, Cambrian formation; by Professsor Hull.*

Silica	60·50
Alumina	19·70
Iron (protoxide)	7·83
Lime	1·12
Magnesia	2·20
Potash	3·18
Soda	2·20
Water	3·30
	100·03

2. *Analysis of a dark-blue slate from Llangynog, North Wales; by D. H. Richards.*

Silurian Rock. Slate dried at 100° C.

Loss on ignition	3·720
Silica	60·150
Alumina	24·200
Protoxide of Iron	5·837
Sesquioxide of Iron	1·815
Not determined (alkalies)	4·278
	100·000

3. *Analysis of the material of the green bands in the bluish-purple slates at Llanberis; made by the Royal School of Mines. Cambrian formation.*

Silica	66·45
Titanic Acid	0·63
Alumina	13·38
Protoxide of Iron	1·71
Peroxide of Iron	1·41
Protosesquioxide of Manganese	0·91
Lime	2·86
Magnesia	6·28
Potash	0·05
Soda	0·90
Carbonic Acid	1·30
Combined Water	3·90
Hygroscopic Water	0·13
	99·91

4. *Analysis of the purple slates of Nantlle.—Kirwan's Mineralogy. Cambrian formation.*

Silica	·48
Argillaceous Matter	·26
Magnesia	·8
Lime	·4
Iron	·14
	100

5. *Analysis of a green Westmorland slate; by George Vogt.*

Silica	50·88
Alumina	14·12
Iron Oxide (Ferrous)	9·96
Lime	8·72
Magnesia	8·67
Carbon Dioxide	6·47
Potash	·88
	99·70

It will be seen from the foregoing analyses that slates are chiefly made up of silica and alumina, from which we may reasonably infer that they were once ordinary clay.

The principal difference in the composition of the Welsh blue, Welsh purple, and Westmorland green, lies in the varying proportions of iron which they contain. The blue Welsh slate contained 7·83 per cent. of iron in the ferrous state FeO; the purple contained 14 per cent. of iron in the ferric state Fe_2O_3; and the green Westmorland slate contained 9·96 per cent. of iron in the ferrous state.

It is generally asserted that iron is the agent which

determines the colour of the slate, and it has always been laid down that Westmorland slates derive their colour from the presence of iron in the ferrous state, while the purple slates of North Wales derive their colour, like the marls of the Permian Rocks, from iron in the ferric state; but on examination of the analyses given it will be seen that the iron in the blue Welsh slate is also in the ferrous state, hence it is difficult to determine with any degree of certainty which of the elements plays the most important part in the determination of colour.

One of the most important points to notice in the determination of the quality of a slate is its porousness, as undoubtedly those slates, other circumstances being equal, are best which absorb the least amount of moisture, for the absorbed moisture not only increases the weight of the slate, but in frosty weather is converted into ice, and swells, with consequences highly detrimental to the soundness of the slate.

Several experiments have from time to time been made to demonstrate this quality. I will only mention two, which I have made specially for this Paper.

I took three slates, each having a surface of 144 square inches. I had them all carefully weighed, and then placed in a bath of water. One was taken out after an immersion of fifty hours, and after the surface-water had ceased to drip, was weighed again, and I found the weight 100 grains in excess of its original weight. It was then placed before a fire, and in a few minutes the surface was quite dry, and on being put on the scales again was only 30 grains in excess of its original weight. The other two slates were in the water 312 hours, and after the surface-water had ceased to drip I placed them on the scale. In the one case the increase in weight was 127 grains, and in the other 200 grains. Both were then placed before a fire, and, as in the first case, the surface was perfectly dry in a few minutes, and on being again weighed one was 8 grains heavier than its original weight, while the other was exactly its original weight. This shows in one case the absence of any absorption, and in the others only a few grains, which may be considered as highly satistactory.

It may be taken that the amount of moisture the best Westmorland and Welsh slates may absorb is not sufficiently great to make any material difference in their weight, or in the action of frost upon the absorbed moisture; but there are slates to which, from their flaky and jointy nature, the absorption of moisture is highly detrimental, as the absorbed water when frozen tends to loosen the joints and open the flakes, which process, when frequently repeated, materially damages such slates. These, however, when used in countries less liable to sudden and violent changes in temperature than we are in England, prove as serviceable as the best known slates in this country. There is still another point of importance depending upon the compactness or otherwise of the slate. It was shown by the tables of analyses that all slates contain varying percentages of iron, some in the ferrous and some in the ferric state. Iron, as you all know, has a great affinity for oxygen, and if the slate be porous the oxygen of the air combines with the iron when in the ferrous state, changing it into ferric, with the result that the colour is altered and decomposition on a small scale is carried on.

In addition to this there is a further chemical action that takes place, and a much more disastrous one than the changing of ferrous into ferric oxide. As the analyses show, all the slates contain calcic carbonate, and some of them magnesic carbonate. If the slate be sufficiently porous to admit carbon dioxide (Co_2), which is equally prevalent in otherwise pure and impure atmospheres, the carbonates are changed into bi-carbonates, which are soluble in water—$CaCo_3 + H_2Co_3 = CaH_2(CO_3)_2$—the natural result of this being that the slate will in time decompose, and its "waterproof" quality be eventually destroyed.

Some time ago a Swiss scientist contributed a Paper on Slates to one of the magazines, in the course of which he suggested the following experiment to test the quality of a slate:—Reduce the slate to powder, add hydrochloric acid; if strong effervescence, proof of a bad slate, full of lime. A portion of another slate is taken, and likewise reduced to powder, and placed in a test tube and heated over a Bunsen flame. A yellow sublimate and fumes of sulphurous acids prove the presence of much iron pyrites, consequently a bad slate.

I am afraid I cannot agree with these conclusions, as my experience, and that of many others, of slates containing both lime and iron pyrites proves the contrary.

The analyses I have given show the presence of lime in all the slates which, on the application of HCL., gives a brisk effervescence, and if the above contention be correct, we must classify all these as bad slates, whereas quite the contrary is the fact.

The best Westmorland slates which we know have stood the action of the atmosphere in some instances at least 100 years; and of some of them it would be safe to state that they have been exposed 200 years, and still show no signs of decay. The same might be said of some slates containing iron pyrites, which would give chemical results pointing, according to this theory, to a bad slate; but here, again, we are in a position to produce slates heavily charged or permeated with iron pyrites—such, for instance, as the Ballachulish and Easdale slates, in the North of Scotland, both of which have stood for a considerable time, without the least sign of decay from this cause.

After all, I am much inclined to believe that there is a limit to chemical analysis in the determination of the quality of a slate. The chemical composition of most slates with which we have to deal is very much the same, but we do know that the wearing quality of the various slates differs materially. All this seems to me to suggest the presence of another agent playing an important part in the formation of a slate, and I humbly submit that the *mechanical arrangement* of the particles contained in the slate has more to do with the determination of quality than the best conceived proportions in chemical analysis.

If we were to take the various elements or ingredients which from analysis we know constitute the best slate, mix all together, and apply sufficient pressure to produce a compact sheet or block, we should not produce an article possessing the same qualities as an ordinary roofing slate.

In support of this theory, I beg to mention as an illustration the substances known as diamond and graphite, both of exactly the same chemical composition but differing widely in their properties and ultimate value, which seems to me to point to a different mechanical arrangement of the particles of which the two substances are composed.

How, then, are we to determine the quality of a slate? For my part, while acknowledging with gratitude the assistance obtained from the chemical laboratory, I am of opinion that the best and safest of all tests is that of experience. We know from evidence furnished us by buildings erected 80, 100, and even 150 years ago that certain materials have stood the most severe of all tests, that of time; and until chemical science has discovered a more reliable one, we must give time and experience the pre-eminence.

Amongst those materials I may safely state that none are more conspicuous and none have more highly distinguished themselves in the war with the elements than Westmorland green slates.

General Description of Westmorland Slate Quarries; the Method of Preparing the Slates. Clearage. Architectural value. – The question of cleavage is perhaps one in which the quarry owner is more directly interested than the architect, but a Paper on slates would be far from complete if no reference were made to this subject, and on this ground I

crave your indulgence while notifying some of the principal points coming within our scope under this heading.

While scientists are mainly interested in discovering the agent or agencies by which cleavage was produced, the quarry owner, on the other hand, is more especially concerned in the character of the cleavage in the particular bed of slate he is working, as on the nature of the cleavage depends to a large extent the value of his bed of rock. This property of slate rock by which we are enabled to split it into thin pieces consists of lines or lamination planes running in the direction of the strike of the bed, and always at right angles to the dip of the rock, but cleavage lines occur at varying angles of inclination from the planes of bedding. In Westmorland the cleavage lines are not so well developed as in the slate rocks of North Wales, where it is possible to split a block $2\frac{1}{2}$ inches thick into 40 slates equal to $\frac{1}{16}$ of an inch each in thickness. It would, however, be well-nigh impossible to get from any Westmorland rock an equal number of slates from a block of the same thickness.

As to the manner in which slaty cleavage was produced, I will merely mention that there are two theories—the magnetic and mechanical.

The former was held by, amongst others, Professor Sedgwick, in support of which it is pointed out that the direction of the cleavage being N.N.E., coincides with the course taken by the magnetic currents which are passing through the earth.

On the other hand, it is assumed by a number of eminent scientists that cleavage is due to mechanical forces that compressed the sediment at right angles to the line of cleavage. Dr. Sorby, who studied and examined it microscopically and otherwise, states that the "sedi-"ment has been compressed to about one-half of its origi-"nal bulk, and the particles pressed with their flattest "sides towards each other." This arrangement may be seen by grinding a piece of slate thin enough to admit light through it, the particles may be then discerned by the aid of a pocket lens, or to better advantage if placed under a microscope. The specific gravity of Westmorland slates is as follows:—

Green, 2·77. Blue, 2·73.

If all the slates were split to equal thickness, the difference in weight on roof timbers would be very small, whichever kind of slate was used.

The late Bishop Watson gives in his Chemical Essays the result of a series of tests made to determine the weight of a cubic foot of slate, and he found that the difference between a cubic foot of the heaviest and a cubic foot of the lightest of 14 different sorts was only 65 oz., or about $\frac{1}{43}$ part of the weight of the heaviest sort. The following is a list of the tests:—

	Ounces.
Purple Slate. Kentmere, near Kendal	2797
Pale Blue. Coniston, Waterhead	2791
Dark Blue. Troutbeck	2781
Pale Blue. Thrang Crag	2780
Pale Blue. White Moss	2779
Deep Blue. Old Cauldron	2778
Pale Blue Greenish. Near Ambleside	2768
Pale Blue. Ingleton, Yorkshire	2767
Dark Writing Slate. Bannisdale	2765
Blackish. Head of Windermere	2758
Deep Blue. Langdale	2752
Greenish Blue. Kentmere	2750
Blackish. Cartmell, Lancashire	2740
Very Pale Blue (fine grained.) Ambleside	2732
Medium weight of cubic foot	2767

It is possible that there may be some present who have not had an opportunity of visiting a slate quarry, and witnessing the process of slate-making, and perhaps a few descriptive remarks will therefore not be out of place.

Slate quarries may be divided into two classes, open top and underground. The former, when situate on the hill-side, are generally worked by means of adit levels, through which the slate material and débris are carried out; but when in the bottom of the valleys are worked "pit" like, and the material for slate working, débris, as well as the water, are hoisted to the surface by means of steam engines or hydraulic machinery.

As to the best and most economical of these two methods to adopt, much depends on the nature of the rock, and the amount of "top rock" overlying the slate. If the slate rock be capped with a great thickness of "top rock," it will as a rule be cheaper to work the quarry underground, as the cost of removing this would be so great as often to render the working unprofitable. On the other hand, by working the quarry "close head," or underground, the removal of the "top rock" is dispensed with, but a much larger percentage of the good slate rock is spoiled than in the open quarries, and the work of rendering the roof safe is often very costly.

These are some of the considerations which frequently tax the best energies and resources of the management.

When commencing slate-making it is necessary in the first place to blast the rock from the cliff-side: this is done by means of a hole varying from $\frac{5}{8}$ to $1\frac{1}{2}$ inch in diameter, according to the size of the piece to be dislocated. The depth of the hole depends on the distance the first joint or "back" may be from the face. The hole being bored, a charge of gunpowder is put in, which is fired by means of a fuse or short straw filled with small gunpowder, having fixed to the end a piece of "match paper."

The "docker-up" now proceeds to view the dislocated rock, and by means of a hammer and chisel reduces the blocks into smaller and more convenient pieces. They are now loaded into waggons, and either taken out through the tunnels, or hoisted to the surface by the aid of machinery, and delivered in front of the splitting sheds, their final destination prior to being made into roofing slates.

There is a considerable variation in the size of the blocks, and good judgment, only acquired by experience, is necessary to cut them, so as to avoid waste and to the best advantage. Thus a block 6 feet long × 2 feet wide is cut into two pieces of three feet long each; this is done by cutting a small aperture on one side and applying a series of heavy blows with a wooden mallet on the other side immediately above the aperture; by this means the block is cut in two. It is now ready for the splitter.

There are two methods of splitting in Westmorland, viz. chisel riving and hammer riving, the latter is peculiarly characteristic of Westmorland—the chisel riving alone being in use in Wales. The chisel-river does his work seated with crossed legs, always putting the left leg over the right; any departure from this is considered slovenly and bad form. He now takes a block, and, resting it on his left knee, proceeds to reduce it to thin slates by the aid of mallet and chisel. The hammer-river, unlike his colleague, works standing. A raised platform or bench is provided on which the block is placed, held by his left hand, while, with the hammer in the right hand, he applies a series of gentle blows along the cleavage planes, with the result that the block is reduced into thin slates. This latter method is much more tedious, and on the whole less expeditious than the former, in addition to which it takes much longer time to become a good hammer-river than a chisel-river.

I may just mention in passing that at Collyweston, in Northamptonshire, slates are produced which are prepared in a somewhat novel manner. The blocks, which are usually quarried in the autumn, are placed in a position in which the moisture will most readily percolate into the natural joints. The moisture freezes, and the blocks split of themselves into slates suitable for roofing purposes.

As to the antiquity of the slate industry in Westmor-

land, it is difficult to find any reliable data; but it will be perfectly safe to say that quarrying in a crude manner has been carried out for centuries. It is interesting to find, however, that about 100 years ago slates were sent from a Westmorland quarry for Montague House, Whitehall, the Duke of Buccleuch's London residence, from which we may reasonably infer that quarrying had then attained some proportion, and was being carried on more or less systematically; and it may be mentioned here that when this same house was rebuilt about forty years ago the same slates were used over again, and it was found that they worked out so well that new ones were only sent for the additional area to the roof.

Up to within about thirty years ago the method of quarrying was, however, still rather primitive, and the quantities produced on a limited scale. This was in a large measure due to the difficulties of transit, want of enterprise on the part of the owners, and what was perhaps worse than all, the reluctance of both masters and men to adopt the most improved and expeditious methods of producing. In consequence of this indifference the industry was at one time in great danger of becoming a thing of the past. However, during the last twenty years a remarkable change has been effected in the Westmorland slate trade. The facilities for transit are greatly improved. More energy has been displayed, and more scientific knowledge has been brought to bear upon the working. The newest and most improved methods of production are now employed, with the result that more quarries are in operation, more men engaged, and larger quantities by more than double are produced at this moment, than at any other period in the history of the industry. The outlook for the future is encouraging, the quarries are being deepened, and with increased depth there is always improved quality. The production in the area under our consideration has increased, according to the figures given in the mineral statistics, from 5,309 tons in 1886 to 17,291 tons in 1894. These figures speak for themselves, and point to the growing popularity of these slates amongst architects, and also to unmistakable activity in the slate trade of the northern counties. From an architectural point of view, Westmorland Green Slates are exceedingly valuable. There are no slates with which the architect has to deal that will give more satisfaction and produce better effect than these. They possess all the necessary qualities of a good slate; they are hard—and all good slates are hard, although it must not be taken that all hard slates are good. When struck they will give a clear, ringing sound like a solid piece of metal, whilst the sound from an inferior slate is always dull and thick. Their colour is the most beautiful of all, and, especially when used in combination with any building material of a red or terra-cotta shade, produce a most charming effect. Their lasting quality is proverbial; once a roof is properly covered with Westmorland Green Slates, it is seldom, if ever, any repairs are needed; and when the building has, owing to age or other circumstances, to come down, the slates are as sound as ever, and with a little dressing may be used over again. Their strength and resisting power are very great; it takes on an average 20,000 lb. weight to crush one cubic inch. This quality, in conjunction with their tenacity and elasticity, enables even thin slates to sustain great weight, and gives to them a pre-eminent commercial value for roofing purposes.

In addition to making good slates, the rock is also capable of being worked for other architectural purposes, in the shape of building and monumental stones of almost every description.

Table of Strata.

	Welsh equivalents.
Ludlow Rocks =	Upper Ludlow. Aymestry Limestone. Lower Ludlow. Upper Wenlock.
Coniston Flags and Grits =	Denbighshire Grits. Lower Wenlock.
Coniston Limestone =	Bala Limestone.
Green Slate and Porphyry Series =	Part of Bala, whole of Llandilo, and perhaps part of the Arenig Formation.
Skiddaw Slates =	Arenig, with perhaps Tremadoc and Lingula Flags.

Total production of the different Counties in England, Scotland, and Wales during the year 1894.

	Quantities in Tons.	Value at Mines or Quarries. £.
ENGLAND AND WALES—		
Breconshire	—	—
Carnarvonshire	267,083	573,367
Cardiganshire	241	447
Cornwall, Devonshire	12,095	23,565
Cumberland	2,786	5,512
Denbighshire	1,524	4,485
Lancashire, Westmorland	14,505	40,507
Leicestershire	10	20
Merionethshire	157,816	509,616
Montgomeryshire	3,257	8,229
SCOTLAND	No returns.	—
Totals for 1894	461,673	£1,171,366
„ „ previous year	438,993	£1,107,626

Quantity and Value of Roofing Slates exported from the United Kingdom in the years 1893 *and* 1894.

	1893		1894	
Countries to which Exported.	Quantities. Number.	Declared Value. £.	Quantities. Number.	Declared Value. £.
Norway	—	—	121,500	1,458
Denmark	2,411,800	29,158	2,852,700	34,211
Germany	30,922,700	141,743	33,465,100	174,951
Holland	308,500	1,012	10,000	27
Belgium	1,044,900	1,120	519,600	427
Channel Islands	523,700	4,243	570,600	4,481
France	1,009,300	1,436	933,400	2,223
Canary Islands	—	—	1,000	48
Austrian Territories	381,800	898	401,500	681
Roumania	—	—	10,500	91
Turkey	3,000	31	—	—
Egypt	7,200	49	—	—
West Coast of Africa	13,700	130	2,000	26
St. Helena	—	—	2,400	31
British Possessions in South Africa	500,500	4,101	445,300	3,578
British East Indies	93,700	816	84,600	568
Australasia	1,374,400	9,979	921,500	7,061
British West India Islands and Guiana	97,600	731	27,000	280
Foreign West Indies	25,300	150	22,700	135
Mexico	2,000	8	—	—
Chile	—	—	9,000	40
Brazil	19,000	124	3,600	53
Argentine Republic	—	—	55,000	443
Totals	38,739,100	£203,729	40,459,000	£230,813

Total production of the different Counties in England, Scotland, and Wales during the year 1886.

	Quantities in Tons.	Value at Mines or Quarries.
ENGLAND AND WALES—		
Breconshire	89	£112
Cardiganshire	155	349
Carnarvonshire	250,952	619,493
Cornwall	11,840	21,415
Cumberland	1,954	3,908
Denbighshire	3,016	4,603
Devonshire	1,070	1,055
Durham	1,469	1,005
Lancashire and Westmorland	3,355	6,509
Leicestershire	500	1,000
Merionethshire	144,034	408,181
Montgomeryshire	1,058	2,130
Somersetshire	1,000	2,000
Yorkshire	17,161	8,370
	437,653	£1,080,130

	tons	£
SCOTLAND—		
Argyllshire	17,355	24,639
Dumbartonshire	500	1,000
Perthshire	700	1,400
	18,555	£27,039
Totals for Great Britain for 1886	456,208	£1,107,169
Totals for 1885	468,954	£1,175,772

Quantities and Value of Slates exported from the United Kingdom during the years indicated.

Year.	Number.	Value.
1877	37,565,282	£294,515
1878	24,268,500	204,636
1879	27,801,100	183,915
1880	31,189,500	176,533
1881	38,415,100	212,699
1882	47,366,300	250,226
1883	84,544,400	192,257
1884	49,035,600	251,824
1885	45,482,000	242,484
1886	43,389,700	227,648
1893	38,739,100	203,729
1894	40,459,000	230,813

Quantities and Value of Roofing Slates exported from the United Kingdom in 1885 *and* 1886.

Countries to which sent.	1885 Quantities. Number.	1885 Declared Value. £.	1886 Quantities. Number.	1886 Declared Value. £.
Russia	—	—	9,500	83
Sweden	60,500	574	—	—
Norway	10,200	70	—	—
Denmark	2,442,300	27,888	1,816,000	19,497
Germany	31,279,100	148,952	31,828,700	155,962
Holland	307,100	913	301,000	1,004
Belgium	373,800	268	567,000	623
Channel Islands	595,700	4,139	532,500	3,764
France	1,571,500	3,291	790,000	1,113
Spain	—	—	7,300	49
Gibraltar	1,800	22	6,000	60
Austrian Territories	680,900	1,592	1,498,600	3,602
Turkey	4,000	75	—	—
West Coast of Africa	40,901	259	8,500	74
British Possessions in South Africa	291,530	1,646	197,200	1,067
British East Indies	69,900	596	6,000	43
Australasia	7,491,900	49,581	5,433,800	38,077
British North America	—	—	6,000	34
U.S. of America on the Atlantic	—	—	34,900	132
British West India Islands and Guiana	—	—	14,500	104
Foreign West Indies	5,000	44	—	—
Brazil	—	—	12,000	80
Uruguay	3,000	28	—	—
Argentine Republic	252,900	2,366	291,200	2,280
Totals	45,482,000	£242,484	43,389,700	£227,648

PARLIAMENTARY.

Proposed Removal of St. Mary Woolnoth.

Now that the question of demolishing the Church of St. Mary Woolnoth is again before the public, it has been thought desirable to reprint the petition which the Council of the Institute presented to the House of Commons in 1892, as follows:—

1. A Bill has been introduced into and is now pending in your Honourable House, intituled "A Bill to empower "the City and South London Railway Company to make "an underground railway to Islington, and for other "purposes."

2. On the deposited plan accompanying the Bill, the Church of St. Mary Woolnoth, situate at the junction of Lombard Street and King William Street, is scheduled, and numbered 39 on the plan, with the apparent intention of being acquired for the purposes of a railway station; and under the Bill powers are sought to deal with the property.

3. Your Petitioners, moreover, have learnt from the Directors of the City and South London Railway Company that "If it should be found necessary to remove the "structure [of St. Mary Woolnoth] it is proposed to re-"erect it on some site where it can be made more useful "than where it now stands, and it is proposed in that case "to substitute for it a handsome architectural building."

4. A church has stood where St. Mary Woolnoth now stands for many centuries; and, though the date of the erection of the first church on that site is unknown, a record of the existence of one there in the middle of the fourteenth century is extant. About the year 1677 the church of St. Mary Woolnoth was repaired, partly in consequence of injuries received during the Great Fire of London, the Lombard Street front having been then rebuilt, though the mediæval interior remained. The building, however, was found at the beginning of the eighteenth century to be in so ruinous a condition that a new church—the present one—was commenced under the direction of Nicholas Hawksmoor, a friend and one of the most distinguished pupils of Sir Christopher Wren. The work, which was finished in 1719, has been truly described as an exquisite example of the Italian style of architecture, its interior being in some respects unrivalled by most of the churches erected under Wren's immediate direction.

5. The church of St. Mary Woolnoth is a conspicuous ornament, and one of the historical landmarks of the City of London. By its traditions, no less than by its architectural character, it is recognised as one of the public monuments which impart artistic grace to the metropolis, and which it is incumbent on the present generation to hand down to posterity unimpaired. The removal of the church would destroy one of the most admired features in the familiar view from the large open space between the Bank, the Mansion House, and the Royal Exchange; and it cannot be justified by any object sought to be attained by the Bill.

6. Your petitioners believe that it is possible for the City and South London Railway Company to acquire sites suitable for their purpose other than that of St. Mary's Woolnoth—sites where the needs of a railway station would be less likely to block the traffic than at the immediate entrance of a thoroughfare so crowded and at the same time so narrow as Lombard Street. In this belief, they desire to record their opinion that the removal of the church of St. Mary Woolnoth would be an act of vandalism as unnecessary as it is unjustifiable, and that the substitution for it of a railway station would be inevitably followed by results disastrous to the public convenience.

Your Petitioners therefore humbly pray your Honourable House that the Bill may not pass into a law as it now stands.

A Teaching University for London [p. 92].

At a meeting of Convocation of the London University on the 21st January Professor Sylvanus Thompson moved a resolution in favour of the early introduction of a Bill for the reconstitution of the University similar to that introduced last year by Lord Playfair, but with an additional clause securing to all bodies affected the right of appeal to the Privy Council on any of the provisions which might be settled by the proposed Statutory Commission. Professor Thompson observed that all the evidence of other Universities which had been enlarged from examining bodies to seats of learning showed that such a development always tended to increase the prestige of the University so enlarged, and to enhance the value of its degrees. Dr. Napier moved an amendment declaring it to be inexpedient for Convocation to express any opinion as to the expediency of legislation for the reconstitution of the University till the views of all members of Convocation had been ascertained. After discussion the amendment was rejected by 466 to 240 votes, and the resolution agreed to.